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ABSTRACT

This competency-based curriculum is designed to be a handbook for courses in renewable natural resources/agriculture in Alaska. It details the competencies, developed through a survey of renewable natural resources/agriculture employers in Alaska, that such occupations require. The handbook is organized in six sections. Section I introduces the concept of competency-based curriculum and the role of vocational educators in curriculum planning and implementation. Section II provides the scope, sequence, and hierarchy of renewable natural resources/agriculture instruction. Section III presents the curriculum, including the following competencies (and related tasks): leadership/citizenship, introduction to natural resources, agricultural mechanics, animal science, plant science, soil science/agronomy, horticulture, land/water/air management, fishing and fisheries, forestry/production/processing, outdoor recreation, self-sufficiency, and wildlife use and management. Section IV contains course descriptions to assist school districts in developing their vocational programs. Section V provides curriculum analysis matrices for determining competencies to be included in specific renewable natural resources/agriculture courses. Section VI contains a sample skills card for evaluating and recording student progress. Section VII lists information on resources and specific materials available in Alaska and the rest of the nation. (KC)

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Renewable Natural Resources/ Agriculture Curriculum

**Secondary and Postsecondary
Articulated Curriculum**

**State of Alaska
Steve Cowper, Governor**

**Developed by the
ALASKA DEPARTMENT OF EDUCATION
Adult and Vocational Education**

William Demmert, Commissioner

Karen Ryals, Acting Director for Vocational Education

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Foreword

"Self-Sufficiency" vs. "Subsistence"

The word "subsistence" has taken on a special meaning in Alaska. In a broader general usage, "subsistence" refers to a subsistence economy, an economy in which goods and services are produced and consumed locally by an indigenous population. This is in contrast to a cash economy, an economy in which money is used as a vehicle for trade and in which goods and services are traded extensively between regions and between groups of people.

In Alaska there are virtually no complete subsistence economies, but there are many groups of people who provide many products for themselves by collecting and processing local resources, especially the products of hunting, fishing, and gathering. The subsistence activities are combined with a cash economy, establishing many mixed economies throughout the state. Usually in Alaska when the word subsistence is used, what is meant is the collection of food from natural resources for local consumption (Often this definition is further narrowed to meaning the use of these natural resources by people who live in rural areas and who provide a large proportion of their total food by such means.) Some groups, especially those who have historically used particular natural resources or can show special need or cultural association, have been granted preferential access to certain natural resources for their own consumption. This preferential treatment has often been the center of much debate within Alaska.

It is not our purpose here to address the controversies regarding subsistence, but to present the various skills necessary to live a "subsistence lifestyle" in Alaska. To incorporate those skills not necessarily historical; but which can be termed a "self-sufficient" lifestyle, we will, for the purposes of this curriculum use the term "self-sufficiency" in place of subsistence.

This competency-based curriculum is designed to be a handbook for renewable natural resources/agriculture in Alaska. It includes competencies a student will acquire in Renewable Natural Resources/Agriculture. Such courses cover the following areas: Horticulture; Animal Science; Soil Science/Agronomy; Agricultural Mechanics; Land, Air and Water Management; Forestry; Fishing and Fisheries; Outdoor Recreation; Self-Sufficiency; and Wildlife Use and Management.

Development of this handbook began with a survey of Alaskan renewable natural resources/agriculture employers. Their priorities regarding the skills and knowledge students need to acquire to survive and thrive in the industry form the basis of this handbook. For example, industry's emphasis on the importance of communication and personal skills is reflected in the Employability Skills area of the Leadership/Citizenship unit.

This handbook stresses the importance of understanding the forces affecting Alaska's renewable natural resources/agriculture. Most units begin with definition of terms and principles so that students will have conceptual frameworks for adding the details of various techniques.

The ten areas of concentration, while not intending to be comprehensive and inclusive of all employment in renewable natural resources/agriculture in Alaska, concentrates on major areas. The competencies and tasks are presented so that instructors have the prerogative to determine which aspects they want to teach in either overview course(s) or in specialty courses. Natural Resources areas were organized along the following lines: I. Work With the Resource, II. Use the Resource, III. Manage and Protect the Resource, IV. Define the Resource V. Understand the Importance of the Resource, VI. Understand Competing Uses so that students can obtain hands-on experience and then theoretical knowledge. Agriculture areas were generally organized in the way that agriculture is taught.

The handbook is organized in six sections:

Section I introduces the concept of competency-based curriculum. The role of vocational educators in curriculum planning, implementation and evaluation is also included.

Section II provides the scope, sequence and hierarchy of Renewable Natural Resources/Agriculture competencies.

Section III presents the curriculum including the competencies and tasks for natural resources agriculture instruction.

Section IV contains course descriptions to assist school districts in developing their vocational programs.

Section V provides curriculum analysis matrices to be used to determine competencies to be included in specific renewable natural resources/agriculture courses.

Section VI contains a sample skills card for evaluating and recording student progress.

Section VII lists information on resources and specific materials available in Alaska and the rest of nation.

It is recommended that all students participate in career awareness and exploration experiences to help them understand the connection between school, work and, career plans.

Acknowledgments

Special appreciation is expressed to Richard Steele who authored this handbook, and to Mark Hanson, Associate Director of the South East Regional Resource Center, who administered this project.

This handbook reflects the competencies for entry-level employment in targeted renewable natural resources/agriculture industries. It reflects input from numerous Alaskan natural resource professionals. Thanks and recognition go to the following companies, corporations, offices, and associations for their assistance in completing the natural resources survey and for their suggestions and additions:

Alaska Guide Board	Nana Corporation
Alaska Loggers Association	Pakka Associates
Alaska Miners Association	R & M Consultants, Inc.
Alaska Seafood Marketing Institute	Resource Development Council
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Alaska Women in Timber	Sealaska Corporation
Bristol Bay Native Corp.	Society of American Foresters
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This handbook reflects the competencies for entry-level employment in targeted areas of agriculture as well. It reflects input from Alaskan agriculture professionals. Thanks and recognition go to the following companies, corporations, offices, and associations for their assistance in completing the agriculture survey and for their suggestions and additions:

A & F Enterprises	Echo Lake Nursery
Alaska Homestead Soil Consultants	Goldbug Greenhouse
Alaska Horticultural Company	Green Acres Landscaping
Anchor Point Farms	Homer's Green Thumb
Aspen Tree Surgery	Flower Blossom Greenhouse
Big Lake Greenhouse & Nursery	Kleinert's Landscaping
Bob's Landscaping Service	Landscapes by Design
Custom Landscapes	Nancy's Lakeview Nursery
Custom Tree Services	R & L Tree & Landscaping Service
Dirty Prince Design & Land	R H Enterprises

Resurrection Greenhouse
Salmac Northern
Skagway Gardens
Southeast Landscape & Nursery
Stefanski Brothers

The Crackerbox
Tom Kraus Farms of Alaska
Valley Hydro Seed
Whitestone Farm Enterprises
Wintergreen Farm

A task force of Alaskan educators in renewable natural resources/agriculture education helped to define the units, competencies, and tasks. The task forces which met to finalize this handbook deserves a great deal of credit for their hard work and valuable input. Those in the area of natural resources met in Juneau in June. They included:

Dean Argyle, United States Forest Service, Juneau
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Larry Bright, Fairbanks North Star School District
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Joel MoLyneux, Kotzebue Technical Center
Jim Preston, Juneau Douglas High School
Bob Woolf, Excursion Inlet

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Mike Behner, North Pole High School
Ted Berry, Matanuska-Susitna Community College
Mike Carlson, Delta Junction High School
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Jim Douglas, Cooperative Extension Service, Juneau
Eric Henderson, Palmer High School
Dr. Carla Kirts, University of Alaska, Fairbanks
Al Polndexter, Homer High School
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Karen Ryals, Acting Director
Office of Adult and Vocational Education
Alaska Department of Education
January 1988

Introduction to Competency-Based Curriculum

Competency-Based Curriculum

Vocational education should be directed toward the skills, knowledge, and attitudes needed for successful employment. Changes in technology are affecting the job requirements in renewable natural resources/agriculture. Such changes require educators to update their curriculum in order to prepare students for competition in the job market.

An effective method for delivering vocational education is through a competency-based curriculum. This curriculum is based on a task analysis of the key occupations in renewable natural resources/agriculture. Once a competency-based curriculum is set in place, student performance must be measured on levels of proficiency in those competencies. Thus, the critical features of competency-based education are:

- 1) validating competencies to be included in the curriculum; and
- 2) evaluation of student competency levels.

This curriculum handbook sets direction for local curriculum developers. It provides a framework for developing courses of study and lesson plans in local schools.

Curriculum Based On Competencies

Competence refers to the adequate performance of a task. The task may be evaluated according to the performance or process, the product, or both.

Competency-Based Vocational Education consists of programs that derive their content from the tasks performed in each occupation/job and assess student performance on the basis of preset performance standards.

Learning materials define the competencies the student is to learn, the criteria by which the student will be evaluated, and the conditions under which the evaluation will occur.

Competency-based instruction places emphasis on the ability to do, as well as on learning how and why. Student performance and knowledge are individually evaluated against the stated criteria, rather than against group norms.

The competency process utilizes a checklist of attitudes, knowledge, and skills that are commonly needed by entry-level employees in natural resource/agriculture occupations. In developing this curriculum handbook, a cross-section of natural resource/agriculture professionals were asked to respond to the checklist on the basis of needs within their own establishments. The checklists were tallied and summarized to determine which attitudes, knowledge, and skills were common to firms in Alaska. Also, the competencies in each area were ranked as to decreasing importance.

Student Performance Assessment

A curriculum becomes competency-based when students are assessed on the basis of their competence. Sample skill cards are provided in this guide for teachers who wish to use them in assessing the competency levels of their students. The card has four levels of proficiency which allow continued development of skills. The card can be used to monitor students' progress as they move between natural resource/agriculture classes, between teachers and grade levels and between school and work. The completed skills card is an important part of a placement portfolio when students begin their job searches.

Curriculum Delivery Systems

Leadership/Citizenship (Vocational Student Leadership Organizations)

Some of the competencies in this curriculum guide cannot be fully met in traditional classroom and lab settings. The Future Farmers of America (FFA) is a delivery system which can be integrated into the regular school program. Human relations skills as well as job skills will be enhanced by student participation in FFA. FFA activities should complement instruction in the natural resource/agriculture classroom and lab. They should be integrated as a curriculum delivery system and not allowed to become an extracurricular activity. Note that with production agriculture being somewhat limited in the state of Alaska, the situation is unique. As such, the word "farmer" in FFA is a misnomer. FFA is the organization for all renewable natural resources/agriculture students. FFA is for students interested in tanning, hunting, wildlife, forestry--all areas of renewable natural resources, including farming and agribusiness.

Supervised Occupational Experience Program (SOEP), Cooperative Vocational Education (Coop) and On-the-Job Training (OJT)

Some of the competencies identified in this guide cannot be fully developed at a school site. The Future Farmers of America's Supervised Occupational Education Program (SOEP), Cooperative Vocational Education (Coop) and On-the-Job Training (OJT) all allow students to gain work experience. SOEP, Coop and OJT inspire personal vocation and boost citizenship. FFA materials provide a detailed plan for SOEP's by year. These materials assist with Coop and OJT. Such a framework can easily match a four-year program in combined Renewable Natural Resources/Agriculture, Natural Resources alone, or Agriculture alone. The competencies for SOEP are:

Competency: Understand SOEP

Tasks:

- Recognize the Supervised Occupational Experience Program (SOEP) as part of vocational education
- Identify interests in a particular field of renewable natural resources/agriculture
- Explain the relationship between classroom laboratory instruction, SOEP, and Vocational Student Leadership Organizations (such as FFA)
- Identify types of SOEP's and their potential locations
- Describe the assistance needed in developing an SOEP

Competency: Develop an SOEP ownership program

Tasks:

- Identify competencies to develop through ownership SOEP
- Set goals for ownership SOEP
- Plan an ownership SOEP
- Implement the SOEP plan
- Explain why ownership SOEP program records are important
- Evaluate and analyze SOEP progress (records and competencies)

Competency: Develop an SOEP placement program

- Tasks:**
- Describe the characteristics of a good placement program
 - Plan a placement SOEP program
 - Identify an appropriate SOEP placement station
 - Implement the SOEP plan
 - Explain special concerns with cooperative placement
 - Maintain records of competencies and earnings/costs
 - Evaluate and analyze progress

Competency: Analyze an SOEP



- Tasks:**
- Develop financial statements
 - Interpret and use financial statements
 - Develop skills (competency) scales
 - Analyze SOEP programs
 - Evaluate and revise SOEP's based on analysis

Competency: Expand SOEP'S

- Tasks:**
- Describe how to assess the success of SOEP'S
 - Summarize SOEP records
 - Develop plans for expanding SOEP's
 - Apply SOEP skills to the real world of work

A work station in the community offers realistic experiences in fulfilling the program goals in career development and human relations. Cooperative Vocational Education offers an excellent vehicle for the delivery of instruction. With well developed training plans, teachers and employers can cooperate to prepare students for employment. Cooperative Vocational Education extends the instructional program beyond the availability of equipment and instructor time at the local school. Teachers and employers must maintain regular communications to assure that students are receiving a high quality experience. Cooperative Vocational Education is sometimes called On-the-Job Training (OJT). A well-organized and structured Supervised Occupational Experience Program (SOEP) can accomplish the same purpose as Cooperative Vocational Education or OJT.

Other programs offering work experience include the Rural Student Vocational Program (RSVP) and The Job Training Partnership Act. RSVP provides a two-week full time work experience for students from rural areas where job stations are limited or non-existent. JTPA provides on-the-job experience to disadvantaged youth in both urban and rural areas.

Role of Instructor in Curriculum Planning, Implementation and Evaluation

The vocational instructor fulfills many roles which include the following responsibilities:

- Prepares a written vocational program plan.
- Develops and maintains a written program philosophy with objectives that support the philosophy.
- Maintains a written list of competencies identified as needed for the program area.
- Devises and maintains a classroom management system for implementing the curriculum materials provided for the program area.
- Evaluates the curriculum content periodically to determine curriculum changes and updates. This includes the involvement of the students (present and former), advisory committee members, and other personnel.
- Selects units of instruction and plans lesson plans based on the competencies of the occupation.
- Provides appropriate instructional materials, supplies, and equipment for the students to use.
- Provides school guidance counselor with information and updates regarding implementation of the specific curriculum.
- Works to actively recruit, retain and maximize success of non-traditional students (those students who, by virtue of their grades, have traditionally been excluded from this content area)
- Assists students in planning and conducting Supervised Occupational Experience Programs (SOEP), Cooperative Vocational Education (Coop) and/or On-the-Job Training (OJT).
- Reviews the instructional materials to assure that they are free from sex bias and sex role stereotyping.
- Works with an advisory committee.
- Assists and/or serves as an advisor to the appropriate student organization (FFA) related to the vocational program area.
- Plans and arranges an appropriate classroom learning environment. This involves assisting students of different abilities to work at their own pace and in cases where remedial instruction is needed, securing additional help for those students.
- Reinforces basic skills of reading, communication (written & oral) and computation through vocational education experiences.
- Helps determine what objective(s) should be established for students with special needs as a part of the Individual Educational Plan (IEP) development.

- Uses a grading procedure that is made available and appropriate to all students at the beginning of their program.
- Sets an example for grooming and dress that is generally found in the occupational area in business or industry to enable students to establish appropriate standards.

Benefits of Competency-Based Curriculum

Competency-based vocational education offers several benefits to students:

1. The competencies/tasks are directed to the student and provide measurable criteria for determining when the student has acquired the necessary knowledge and skills.
2. Students receive realistic training for the job. They become competent in tasks that are relevant to the occupation.
3. Students know what is expected of them throughout the course. The competencies are made available to them at the onset. They know what they will be doing and how well it must be done.
4. Each student is individually responsible for completing each competency attempted in the curriculum.
5. Students are not compared with other students in their accomplishments because each is expected to work according to his/her individual capabilities and learning style. Because of the various evaluation policies of different school systems, the ideal of not comparing students in determining grades is not always possible. However, the basic thrust of the competency-based program is to evaluate each student according to his/her accomplishment of each task as he/she works up to individual capability.

Program Development

Program Development

The format of this handbook was selected to aid administrators and teachers in concentrating on the skills needed for vocational training. It will assist in selecting the array of units and the delivery system which fit the school. This provides the flexibility of varying the course content to include the most valuable skills as appropriate for the scope and sequence. The primary importance is that students are able to secure foundation skills. Schools can vary their delivery systems to maximize student opportunities by:

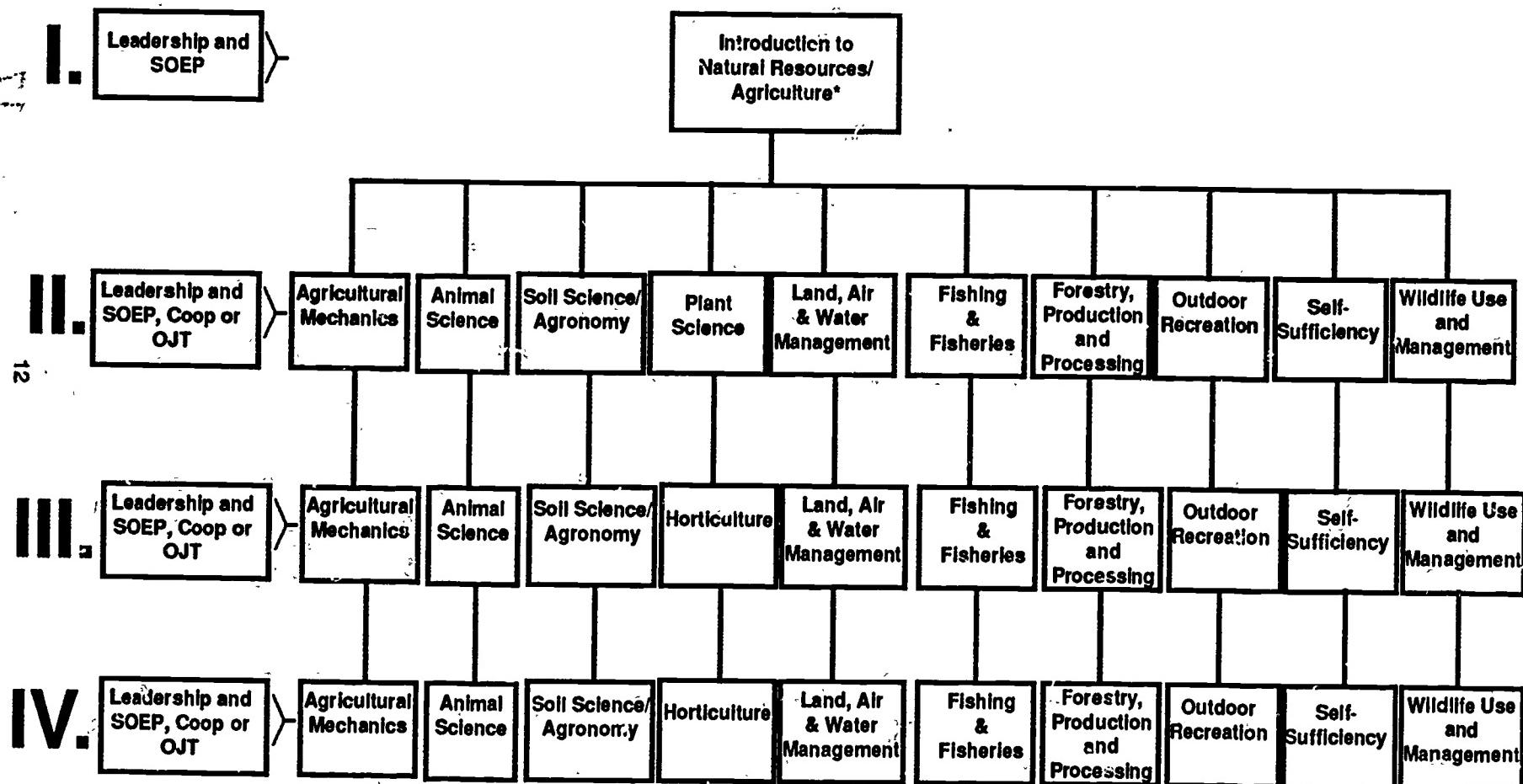
1. Offering courses on alternate years or other planned sequences
2. Offering two or more courses in the same class
3. Providing individualized materials and instruction

Matrices are included in this guide for use in planning the courses to be offered and the content of each course.

The following charts show a hierarchy of Renewable Natural Resources/Agriculture competencies that are emphasized for Natural Resources, Agriculture, or for a combination of both areas:

Level

Hierarchy of Competencies for Combined Renewable Natural Resources/Agriculture

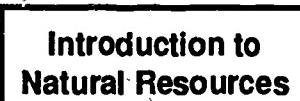


Note: Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.

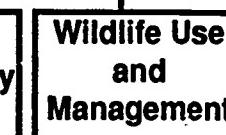
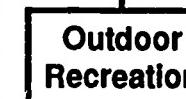
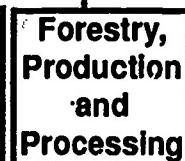
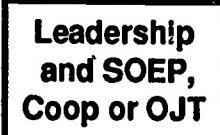
* "Introduction to Natural Resources/Agriculture" is comprised of Leadership and SOEP, Introduction to Natural Resources, and Level I of Agriculture Thrust.

Level

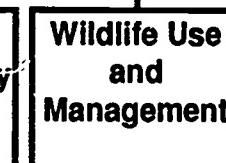
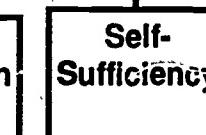
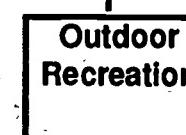
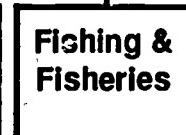
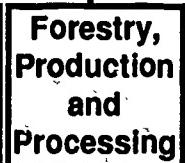
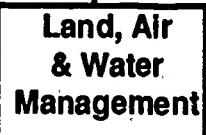
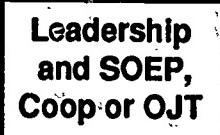
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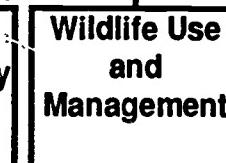
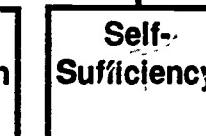
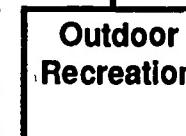
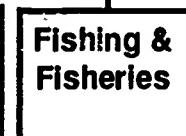
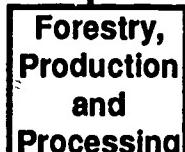
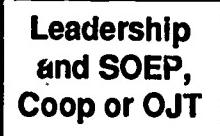
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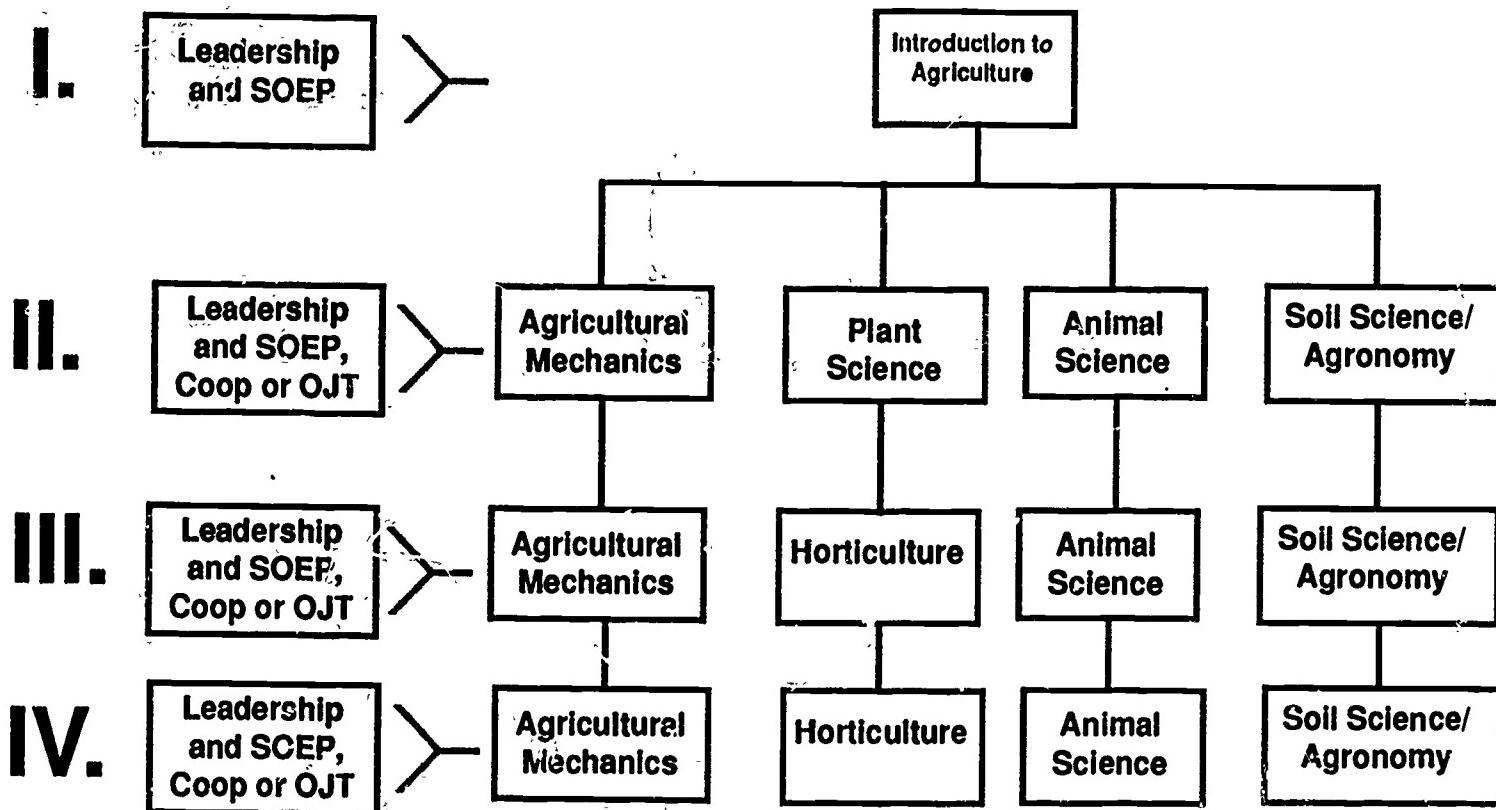
IV.



Note: Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.

Level

Hierarchy of Competencies for Agriculture



Note: Leadership/Citizenship and Supervised Occupational Education Program (SOEP) belong in all four levels. Cooperative Vocational Education (Coop) and On-the-Job-Training (OJT) belong mainly in the last three years.

III

Competencies and Tasks

Leadership/Citizenship

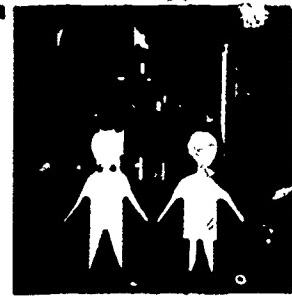
Competency: Understand leadership

Tasks: Attain self-worth by:

- a. working in committees
- b. defining self-esteem and explaining its importance
- c. practicing eye contact
- d. firmly greeting others with a handshake
- e. using presentation skills

Refine social skills

Refine communications skills



Competency: Use effective leadership skills

Tasks: Describe the Future Farmers of America and how it promotes leadership skills:

- a. Participate in meetings according to rules of parliamentary procedure
- b. Function effectively on committees by accepting assigned responsibilities
- c. Plan and conduct effective group leadership activities
- d. Participate in society in a democratic way
- e. Be punctual and dependable
- f. Follow rules, standards and policies
- g. Work cooperatively with others

Identify leadership characteristics and responsibilities

Speak in public including:

- a. speaking formally
- b. speaking informally
- c. teaching individuals and groups
- d. testifying at a public hearing
- e. discussing in a group

Participate in leadership activities

Competency: Use parliamentary procedures

Tasks: Identify voting procedures

Conduct a meeting

Identify types of motions and their order of precedence

Competency: Demonstrate initiative and productivity

Tasks: Organize time effectively

Be responsible

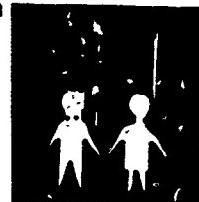
Care about the quality of work

Competency: Demonstrate work maturity

Tasks: Describe the importance of openness to new situations
Demonstrate characteristics of the mature person:

- a. self-acceptance
- b. consideration and respect for others
- c. self-control
- d. positive thinking and attitudes
- e. flexibility
- f. initiative

Identify ways to develop and maintain good work relationships
Differentiate between personal and job-related problems
Follow orderly and systematic work behavior



Competency: Be honest

Tasks: Define honesty and integrity
Explain how to deal with theft and dishonesty
Relate employee integrity to overall company performance

Competency: Be reliable and dependable

Tasks: Maintain acceptable attendance records
Be on time
Give timely notice of interruptions to work schedule
Follow rules of work site or training site

Competency: Solve problems

Tasks: Explain the importance of having a method for analyzing and solving problems
Use the problem-solving process:

- a. identify problems
- b. obtain information
- c. analyze problems
- d. develop and analyze alternative solutions
- e. choose a course of action
- f. persevere through hardships
- g. recognize and change otherwise unworkable solutions
- h. repeat process as necessary to refine solutions

Competency: Be assertive

Tasks: Differentiate between assertive, aggressive, and passive behavior
Discuss whom to go to for employee problems

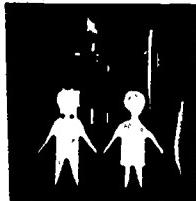
Competency: Maintain good personal relations

Tasks: Use positive attitudes with others
Accept supervision and criticism
Cooperate with others
Accept the chain of command

Competency: Follow verbal and written directions

Tasks:

- Ask for clarification
- Use listening skills
- Review situations of poor communications
- Read directions when assembling and repairing equipment



Competency: Deal effectively with clients

Tasks:

- Greet the client
- Talk politely to client
- Obtain all necessary information from client in writing
- Identify the business on the telephone
- Relay client complaints to employer

Competency: Understand how to be an entrepreneur

Tasks:

- Explain terms and principles associated with entrepreneurship
- Describe the role of self-employment in the free enterprise system
- Identify types of business organizations including:
 - a. sole proprietorship
 - b. limited partnership
 - c. partnership
 - d. corporation
- Identify personal traits necessary for self-employment
- Identify risks and rewards of starting a new business
- Identify the role small businesses have played in job creation and new products and services

Employability Skills

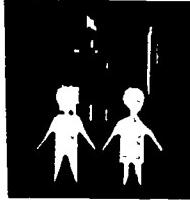
Competency: Work safely

Tasks:

- Inspect equipment and facilities for safety and health hazards
- Follow safe work habits
- Wear appropriate protective clothing
- Use proper lifting and carrying methods
- Identify personal hygiene and sanitation practices
- Interpret information on labels and signs
- Apply first aid
- Maintain and adjust safety shields and devices
- Identify consequences of not following safety precautions
- Follow all safety precautions when using pesticides and farming and welding equipment
- Identify the procedures and requirements for obtaining a restricted use pesticide applicator's license

Competency: Prevent work-related Injuries

- Tasks:**
- Describe the importance of safe working attitudes
 - Describe first-aid and CPR
 - Discuss the importance of wearing protective gear including:
 - a. hardhats
 - b. eye and ear protection
 - c. respirators
 - d. gloves
 - e. chaps
 - f. safety lines
 - g. boots and steel-toed boots
 - Describe safety procedures for:
 - a. boats and aircraft
 - b. chemicals and explosives
 - c. construction materials
 - d. driving
 - e. hand and power tools
 - f. hazardous wastes and carcinogens
 - g. soldering
 - h. wildlife and domestic animals
 - i. working in enclosed areas
 - j. heavy equipment
 - k. ladders and scaffolds
 - l. lifting
 - m. noise
 - n. electricity
 - o. extreme weather conditions
 - p. flammables
 - q. pest control
 - Discuss special safety considerations relevant to each renewable natural resources/agriculture area
 - Drive safely



Competency: Follow OSHA guidelines

- Tasks:**
- Explain the purpose of the Occupational Safety and Health Act
 - Describe your rights under workers-right-to-know and other portions of the act
 - Discuss how to resolve hazardous and OSHA violations situations

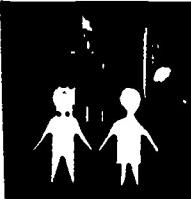
Competency: Maintain good health for effective job performance

- Tasks:**
- Explain the relationship between regular exercise, adequate rest, nutrition, and job performance
 - Explain the issue of smoking on the job
 - Explain drug abuse as it relates to job performance
 - Explain the hazards of infectious diseases and how to avoid them

Competency: Identify personal responsibilities related to employment

- Tasks:**
- Explain the importance of:
 - a. securing adequate transportation
 - b. identifying adequate child care alternatives
 - c. inventorying independent living skills
 - d. developing a personal finance plan
 - Explain employer's expectations regarding substance abuse

Competency: Identify career choices



Tasks: Conduct a self-assessment:

- a. assess values in relation to work
- b. recognize skills and aptitudes
- c. assess employment history and experience
- d. describe obstacles to employment

Identify career clusters:

- a. list specific jobs and duties within clusters
- b. describe apprenticeship/training programs
- c. describe advanced training opportunities

Use labor market information:

- a. identify how to find job information
- b. describe the current local, state, national and international labor market
- c. identify growth/demand occupations
- d. relate career choices to local labor market

Select a career goal:

- a. list how skills could be used in other jobs
- b. develop specific steps to reach goal
- c. incorporate career goals in SOEP, Coop, or OJT

Competency: Identify jobs in renewable natural resources/agriculture

Tasks: Identify educational and occupational opportunities

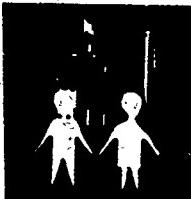
Locate resources for finding employment

Confer with prospective employers in the area of interest

Identify the work of:

- | | |
|--|---------------------------------------|
| a. agricultural carpenter | ee. geologist |
| b. agricultural construction worker | ff. golf course employee |
| c. aquaculture worker | gg. greenhouse employee |
| d. arboretum worker | hh. greenhouse manager |
| e. biologist | ii. greenskeeper |
| f. cannery and frozen food worker | jj. groundskeeper and gardener |
| g. choker setter | kk. inspector or grader |
| h. commercial fisher | ll. interior plantscaper |
| i. dairy farmer | mm. landscape gardener |
| j. dairy processing equipment operator | nn. landscape nursery worker |
| k. dairy products tester | oo. landscape worker |
| l. deckhand | pp. livestock buyer |
| m. equipment operator | qq. log handler |
| n. equipment salesperson | rr. log yard and loading area worker |
| o. faller and bucker | ss. machinery service center employee |
| p. farm worker | tt. machinery service operator |
| q. farmer and rancher | uu. marine mechanic |
| r. feeds, seeds, supplies salesperson | vv. mechanic |
| s. fertilizer serviceperson | ww. nursery salesperson |
| t. fire fighter | xx. nursery worker |
| u. fish and game protection officer | yy. park ranger |
| v. fish and wildlife technician | zz. parts person |
| w. floral designer | aaa. photographer |
| x. florist | aaa. plant scientist |
| y. florist design specialist | bbb. poultry production manager |
| z. forester | ccc. products buyer |
| aa. forestry technician | ddd. recreation guide |
| bb. fruit and vegetable grower | eee. recreation leader |
| cc. garden center worker | fff. seed processor |
| dd. general livestock, crop farmer | hhh. self-sufficient fisherperson |

- | | |
|-------------------------------|--------------------------------------|
| iii. self-sufficient gatherer | ppp. tree pruner |
| jjj. self-sufficient hunter | qqq. tree service worker |
| kkk. sheet metal worker | rrr. tree surgeon assistant |
| lll. small engine repairer | sss. tree trimmer |
| mmm. supplies manager | ttt. water and sewage plant operator |
| nnn. surveyor | |
| ooo. tour guide | uuu. welder |



Competency: Prepare a resume and job application

Tasks: List:

- a. past and present work experience
- b. hobbies and interests
- c. community activities or memberships
- d. in-school activities or memberships
- e. awards, positions, or club offices
- f. adult references, including addresses and phone numbers

Explain the importance of:

- a. obtaining extra copies of applications
- b. reading job applications carefully
- c. following instructions
- d. completing all items accurately
- e. writing legibly
- f. using a word processor
- g. verifying references before listing them
- h. using n/a for items which do not apply

Competency: Write a cover letter

- Tasks:** Explain when and how to write a cover letter
 List the things the cover letter must include
 Explain what a writing sample tells a potential employer

Competency: Prepare for an interview

- Tasks:** Explain how to contact an employer to schedule an interview
 Explain how to respond if asked to come for an interview
 Describe questions and responses asked in an interview
 Explain proper etiquette for an interview
 Describe how to dress for an interview

Competency: Follow up the interview

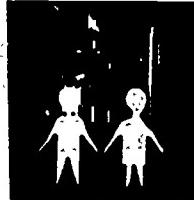
- Tasks:** Analyze the interview
 Determine whether a follow-up letter or call is required
 Explain how to write a thank-you note or make a follow-up call

Competency: Understand employee rights and responsibilities

- Tasks:** Explain state labor laws relating to compensation
 Complete tax forms

Describe:

- a. minimum wage and types of exempt businesses
- b. employee benefits, rights and responsibilities
- c. labor contracts, grievance procedures and the role of unions



Describe a sample personnel policy

Competency: Identify proper job resignation procedures

Tasks: Describe how to:

- a. Write a letter of resignation
- b. Conduct an exit interview
- c. Write a letter of recommendation
- d. Request advance notice
- e. Make final settlements (e.g. retirement, physical injury, social security, severance pay, etc.)

Introduction to Natural Resources



I. What studying natural resources can and cannot do for you.

Competency: Recognize employment opportunities in natural resources

Tasks: Identify employment opportunities and requirements for:

- a. land, air, and water
- b. conservation and regulation
- c. fishing and fisheries
- d. forestry, production, and processing
- e. outdoor recreation
- f. self-sufficiency
- g. wildlife

Identify work in shipping and packaging of renewable natural resources, including:

- a. work as a longshoreperson
- b. work for the Alaska Railroad
- c. work in trucking
- d. work on barges

II. An overview of natural resources.

Competency: Define terms related to natural resources

Tasks: Identify natural resources terms including:

- | | |
|--------------------------|------------------------|
| a. conservation | i. sustained yield |
| b. development | j. capital resource |
| c. human resource | k. natural resource |
| d. multiple use planning | l. preservation |
| e. non-renewable | m. exploitation |
| f. non-sustainable yield | n. carrying capacity |
| g. reclamation | o. potential resources |
| h. renewable | |

Competency: Define the major world natural spheres

Tasks: Identify:

- | | |
|---------------|----------------|
| a. atmosphere | c. hydrosphere |
| b. biosphere | d. lithosphere |

Competency: Define major forces in the physical environment

Tasks: Describe:

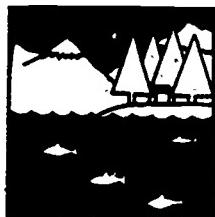
- a. hydrologic cycle
- b. carbon-oxygen cycle
- c. various biogeochemical cycles

Competency: Define important systems in the living environment

Tasks: Explain ecology and ecosystem

Explain:

- a. the pyramid of life
- b. the predator food web
- c. the parasitic food web
- d. the saprophytic food web
- e. energy transfer and trophic levels in the ecosystem



Competency: Identify the role of water resources in natural systems

Tasks: Identify the role of:

- a. the sea on natural systems
- b. water in the atmosphere (humidity) on natural systems
- c. ground water in natural systems
- d. polar ice on natural systems
- e. surface water on natural systems
- f. precipitation levels and water movement on natural systems
- g. glaciers on natural systems
- h. the hydrologic cycle in natural systems
- i. water conservation on natural systems

Explain how to take inventory of the state's water supply

Explain and define watershed

Competency: Define ecological systems in streams, lakes, bays, and inlets

Tasks: Identify the chemical properties of water

Identify the physical properties of water

Trace the stages in lake succession

Explain biochemical oxygen demand

Explain dissolved oxygen levels

Classify lakes by oxygen type

Identify the structure and zones of streams, lakes, bays and inlets

Explain seasonal changes in streams, lakes, bays and inlets

Sample streams, lakes, bays and/or inlets for dissolved oxygen level

Competency: Apply ecological principles

Tasks: Explain the role of the modern ecologist

Identify sciences dealing with taxonomic divisions of biology including:

- | | |
|-----------------|-----------------|
| a. bacteriology | f. ornithology |
| b. botany | g. phytology |
| c. entomology | h. protozoology |
| d. ichthyology | i. zoology |
| e. mycology | |

Identify sciences dealing with life functions including:

- | | |
|---------------|---------------|
| a. ecology | d. morphology |
| b. embryology | e. physiology |
| c. genetics | |

Use applied ecology (i.e. in forest management, watershed management, range management, etc.)



Competency: Define the role of plant and animal succession in the natural world

Tasks:

- Identify factors directing plant and animal succession
- Identify the stages in succession from migration to stabilization
- Explain a succession cycle such as:
 - a. marsh to meadow succession
 - b. bare soil to climax grass and shrubs
 - c. bare soil to climax forest succession

Competency: Define important communities in the natural world

Tasks:

- Differentiate among types of communities; biomes and the ecosystem
- Identify important relationships between species
- Identify important relationships within a species
- Differentiate among food producers and consumers
- Explain effects of seasonal and other changes on living communities

Competency: List Alaska's economically important natural resources

Tasks:

- Identify Alaska's economically important renewable natural resources
- Identify Alaska's economically important non-renewable natural resources

III. History and ethics.

Competency: Understand the pre-contact human interaction with natural resources
(pre-contact meaning before Native and Western cultures came into contact)

Tasks:

- Identify the theory of the Bering land bridge immigration of Native people to North America
- Identify effects of pre-contact Natives on natural resources
- Compare pre-contact interactions with natural resources with post-contact interactions

Competency: Understand pre-contact human ethics related to natural resources

Tasks:

- Identify historic Native Alaskan ethics regarding use of natural resources
- Identify the probable impact of pre-contact societies

Competency: Understand expansion-era human ethics related to natural resources

Tasks:

- Explain environmentally consequential events such as decimation of the buffalo and fur seal
- Identify historic Western European/American ethics regarding use of natural resources
- Explain economic motivations of Russian expansion to Alaska
- Identify impacts of the Russian fur trade on Alaskan resources

Competency: Understand Russian-era human ethics related to natural resources in Alaska

Tasks: Identify the impact of the fur trade on Russian involvement in Alaska
Explain the likely Russian attitude towards endemic peoples
Explain the likely Russian attitude towards natural resources



Competency: Understand the human interaction with natural resources In Alaska from Alaska purchase to statehood

Tasks: Trace the goldrushes:

- a. Klondike
- b. Nome
- c. Fairbanks

Identify types of federal and state-protected and managed areas:

- a. National Forest
- b. National Monument
- c. National Wildlife Refuge
- d. historic area
- e. recreation area
- f. wilderness area
- g. state park
- h. state forest

Describe the motivation behind early federally-protected and managed areas including:

- a. Chugach National Forest
- b. Glacier Bay National Monument
- c. Katmai National Monument
- d. Denali National Park
- e. National Petroleum Reserve
- f. Tongass National Forest

Competency: Understand human ethics related to natural resources in Alaska from purchase to statehood

Tasks: Identify the role of natural resources in the Alaska purchase

Describe the natural resources ethics involved in the goldrush

Describe motivations in quest of natural resources (if any) of the Japanese occupation of Alaska during World War II

Describe the role of Alaska humans in resource management prior to statehood

Compare historic Russian and U.S. attitudes towards natural resources in Alaska

Competency: Understand human interaction with natural resources in Alaska from statehood to present

Tasks: Understand issues related to the construction of the Alaska pipeline

Trace issues involved with the 1978 use of the Antiquities Act in declaring new national monuments in Alaska

Trace the importance of the National Environmental Policy Act (NEPA)

Label portions of Alaska managed by:

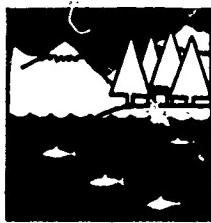
- a. federal government (BLM)
- b. state government
- c. native corporations
- d. private individuals

Identify the role of agencies such as the Alaska Department of Environmental

Conservation, Alaska Department of Fish and Game, the US Environmental Protection Agency and others related to:

- a. air quality
- b. coastal management
- c. drinking water
- d. environmental impact statement
- e. fish and wildlife habitat protection
- f. grants to communities
- g. hazardous wastes
- h. lands management plans
- i. litter and recycling
- j. oil pollution control
- k. pesticides
- l. sanitation
- m. seafood/meat-USDA inspection
- n. sewage treatment and disposal
- o. wetlands protection

Describe the land management and natural resources development and preservation role of Alaska Native corporations



Competency: Understand human ethics related to natural resources in Alaska from statehood to present

- Tasks:**
- Describe how regulations are made and by whom
 - Identify goals of public land policy
 - Explain how the availability of work affects interactions with natural resources in communities
 - Describe the social changes in Alaska which are likely to result from further development in Alaska (economic, political and cultural)
 - Explain how the introduction of aircraft, high-powered rifles and ATV's has affected Alaskan natural resources
 - Describe the natural resource impacts of highways, pipelines, and seaports on natural resources in Alaska
 - Describe the issues of development versus conservation of wild areas in Alaska
 - Describe how a village or town changes with the introduction of telephone and television

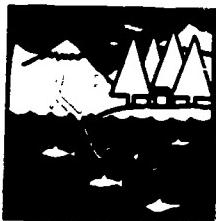
Competency: Understand the role of humans in resource issues

- Tasks:**
- Describe the effects of overpopulation on natural resources
 - Identify factors capable of changing population numbers such as:
 - a. mortality
 - b. fertility rates
 - c. behavior changes (attitudes, birth control, etc)
 - Explain the effects of humans on natural resources, including:
 - a. water use/pollution
 - b. air quality
 - c. noise control and pollution
 - d. soil conservation
 - e. food and fiber production systems
 - f. industrial pollution
 - g. chemical use and pollution
 - h. energy use (nuclear, fossil, natural)
 - i. tyranny of geography (unequal distribution of natural resources)
 - j. fish and wildlife habitat
 - Discuss differing approaches to natural resource management
 - Explain ecological and economical points of view in terms of natural resource development
 - Examine ecological studies

Competency: Understand the management of public lands

- Tasks:**
- Describe the acquisition of public resources
 - Explain how federal lands are converted to state or private ownership
 - Contrast several public and private attitudes towards use of public land
 - Identify trends in the public attitude towards use of public lands
 - Identify legal uses of federal lands, according to type of federal land
 - Discuss the "tragedy of the commons"--problems with public land management
 - Describe the role of other various federal, state, and private, and non-profit agencies dealing with land management and resources issues including:
 - a. Agricultural Experiment Station
 - b. Agricultural Extension Service
 - c. Agricultural Stab. and Conserv. Svc.
 - d. Alaska Center for the Environment
 - e. Alaska Environmental Lobby
 - f. Alaska Loggers Association
 - g. Alaska Miner's Association
 - h. Coastal Zoning Commission
 - i. Fed Water Poll Cntrl Admin.
 - j. Greenpeace
 - k. Land-grant University
 - l. Nat. Audubon Society
 - m. Nat. Marine Fisheries
 - n. Nat. Oceano graphic and Atmsph. Admin.
 - o. Nat. Park Association
 - p. Nat. Park Service

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- t. Alaska Center for the Environment
- u. Alaska Environmental Lobby
- v. Alaska Loggers Association
- w. Alaska Miner's Association
- x. Coastal Zoning Commission
- y. Alaska Women in Mining
- z. Alaska Women in Timber
- aa. Audubon Society--local chapters
- bb. Bureau of Land Management
- cc. Bureau of Outdoor Recreation
- dd. Bureau of Sport Fish and Wildlife
- ee. AK Div of Fish and Wildlife Prot.
- ff. Fed Water Poll Cntrl Admin.
- gg. Greenpeace
- hh. Land-grant University
- ii. Nat. Audubon Society
- jj. Nat. Marine Fisheries
- kk. Nat. Ocean & Atmeph Adm.
- ll. Nat. Park Association
- mm. Nat. Park Service
- nn. The Sierra Club
- oo. Trustees for Alaska
- pp. U.S. Fish and Wildlife Service
- qq. U.S. Forest Service
- rr. Water Pollution Control Fed.
- ss. Water Resources Council
- tt. Wilderness Society



Competency: Contrast rural and urban relationships

- Tasks:**
- Contrast rural and urban educational levels
 - Contrast available recreation in rural and urban areas
 - Contrast rural and urban cultures
 - Contrast rural and urban economies
 - Contrast population growth in rural and urban areas in Alaska

Competency: Understand the importance of planning in proper resource management

- Tasks:**
- Identify people's wants regarding natural resource use
 - Describe how people put monetary values on resources
 - Identify governmental and other incentives promoting conservation
 - Identify conditions under which land plans are required

Competency: Understand principles of conservation

- Tasks:**
- Explain conservation (wise resource use)
 - Identify terms related to conservation of renewable and non-renewable natural resources including:
 - a. carnivore, omnivore, herbivore
 - b. ecology and ecosystem
 - c. population, community, niche
 - d. environment and habitat
 - e. erosion (wind and water)
 - f. reclamation
 - g. recycling
 - h. food cycle/chain/web
 - i. carrying capacity, sustained yield, multiple use
 - Describe man's use and abuse of natural resources
 - Classify important Alaskan renewable natural resources
 - Identify the goals of conservation

Competency: Understand the conservation movement in the U.S.

- Tasks:**
- Briefly outline the history of the U.S. conservation movement
 - Identify important persons in the history of the U.S. conservation movement
 - Identify conflicting points of views in the U.S. conservation movement
 - Identify points of view that resolve conflicts, i.e., use of measures that mitigate resource conflicts

Explain historical events which led to the conservation movement

including:

- a. large fires in the Northwest and Great Lake states in the 1800's and early 1900's
- b. the death of the buffalo and the rise of large horse, cattle, and sheep ranches
- c. overgrazing and ensuing conflicts (range wars)
- d. drought
- e. societal introspection and counter-materialism in the 1960's
- f. world population pressures
- g. highly efficient/mechanized food and fiber production

Identify early leaders in the conservation movement including:

- | | |
|-----------------------|--------------------|
| a. Aldo Leopold | d. Gifford Pinchot |
| b. Theodore Roosevelt | e. Emerson |
| c. John Muir | f. Thoreau |

Competency: Understand major social and economic factors concerning conservation

Tasks: Describe the economic impact of air, water and soil pollution

Describe the economic and societal costs of conservation measures

Describe possible reasons for resistance to conservation

Describe competitive advantages or disadvantages brought about by conservation measures

Competency: Understand human effects on streams and lakes

Tasks: Identify long-term effects of construction on flood-plains

Describe the effects of damming streams for power or flood control

Describe the effects of altering stream channels

Describe the effects of human pollution on lakes and streams

Explain the impact of placing of realistic economic values on water usage

Explain the impacts of thermal pollution (air and water)

Explain the impacts of conservation on the ecosystems of which humans are a part

Competency: Understand technological impacts of highways

Tasks: Describe the loss of farm lands to highways

Describe how a highway can impact an area

Explain changes in human interactions when remote areas become accessible by road

Explain possible changes in wildlife populations when areas become accessible by road

Competency: Understand how to control hazardous wastes

Tasks: Identify types of hazardous wastes

Explain ways to minimize production of hazardous wastes

Explain possible effects of improper disposal of hazardous wastes

Name possible safe ways to transport and dispose of hazardous wastes



IV. Laws, economics, and land ownership.

Competency: Understand laws related to Alaska's natural resources

Tasks:

- Explain the purpose of public law in natural resource management
- Trace development of a law from concept to acceptance
- Identify laws related to placer mining runoff water quality
- Identify laws related to logging in the national forests
- Identify laws related to resource development in national parks, national monuments, and national wildlife refuges



Competency: Understand issues related to land ownership and management

Tasks:

- Identify the land ownership role of the Alaska Statehood Act
- Identify the importance of ANCSA/1991 to Native land ownership in Alaska
- Identify the importance of ANILCA to land ownership in Alaska
- Examine the role of the following agencies in land management in Alaska:
 - a. BLM
 - b. U.S. Forest Service
 - c. National Park Service
 - d. Department of Nat. Resources
 - e. village corporations
 - f. regional corporations
 - g. U.S. Fish and Wildlife Service

Competency: Understand economics related to natural resources

Tasks:

- Identify annual gross receipts of all important Alaskan natural resource industries
- Contrast renewable with non-renewable natural resource industries
- Identify trends in Alaska's natural resource industries
 - a. agriculture
 - b. forestry
 - c. horticulture
 - d. fisheries
 - e. wildlife
 - f. land protection

Agricultural Mechanics

(A) Denotes more advanced competency or task.



Agricultural Mechanics I:

Competency: Maintain shop safety

- Tasks: Wear personal safety equipment and clothing for the task to be performed
Keep the work area free of clutter, flammable materials and other potential hazards
Operate field machinery and equipment according to recommendations in the operator's manual
Use tools, machinery and materials for their intended purpose
Follow all recommended safety precautions

Competency: Use hand tools

- Tasks: Demonstrate the safe use of hand tools
Maintain hand tools in an efficient and safe manner
Identify and use or describe the use of the following hand tools:
- | | |
|-----------------------|-------------------------------|
| a. hack saw | h. pliers |
| b. crosscut saw | i. claw hammer |
| c. rip saw | j. nail punch |
| d. combination square | k. flat head screwdrivers |
| e. level | l. phillips head screwdrivers |
| f. socket wrenches | m. measuring tools |
| g. open wrenches | |

Competency: Use power tools

- Tasks: Demonstrate the safe use of power tools
Maintain tools in an efficient and safe working condition
Identify and use or describe the use of the following power tools:
- | | |
|--------------------------|---------------------------|
| a. band saw | h. power hacksaw |
| b. circular saw | i. power nailer |
| c. impact wrench | j. radial arm saw |
| d. metal cutting bandsaw | k. stationary drill press |
| e. planer | l. stationary grinder |
| f. portable drill | m. table saw |
| g. portable grinder | |
- Identify and describe the use of power tools used in maintaining and repairing equipment

Competency: Use ropes effectively

- Tasks: Make a halter
Tie the following knots and identify situations appropriate for their use:
- | | |
|----------------|--------------------|
| a. square knot | c. bowline |
| b. clove hitch | d. trucker's hitch |

Complete the following splices and identify situations

appropriate for their use:

- a. long splice
- b. end splice
- c. round splice



Competency: Perform basic drafting procedures

Tasks: Follow drafting safety procedures

Care for, store, and protect drafting equipment

Use drafting tools, including:

- | | |
|--------------------|--------------------|
| a. protractors | f. erasers |
| b. triangles | g. drafting pencil |
| c. french curves | h. t-squares |
| d. templates | i. drafting boards |
| e. erasing shields | j. drafting tables |

Make letter and title blocks correctly

Measure and scale drawings

Perfect standard orthographic drawing techniques

Produce drawings

Draw architectural plans for a small structure

Identify occupations which require drafting skills

Complete drafting plans for a metal or woodworking project

(A) Use a Computer-Aided Drafting (CAD) system

Agricultural Mechanics II:

Competency: Use service and repair manuals

Tasks: Read and follow directions given in service and/or repair manuals

Locate in service/repair manuals information needed to complete specific tasks

Complete the assigned maintenance or service tasks according to manufacturers' recommendations

Competency: Order parts, supplies, equipment, and services

Tasks: Describe how to use engine manuals and parts lists

Locate information in engine manuals such as:

- a. engine specifications
- b. repair procedures
- c. part numbers, prices, and sources

Perform engine repair operations by following repair manual instructions

Calculate prices from parts lists and shipping cost specifications

Competency: Maintain maintenance and service records

Tasks: Determine fuel, lubricant, and supply needs

Keep equipment and parts catalogs updated

Order spare parts and equipment from catalogs using model and parts numbers

Maintain a current file of repair and service companies

Determine equipment and tool needs

Keep equipment repair manuals updated



Competency: Operate an agricultural wheel-type tractor

Tasks:

- Perform daily pre-operational check
- Start, operate and stop a tractor safely
- Safely operate a tractor on the highway
- Safely transport tractor

Competency: Maintain and service lubrication system

Tasks:

- Explain engine lubrication systems terms, principles, and components and their function
- Describe the role of lubrication.
- Explain lubrication system diagnosis/repair terms, principles, and methods
- Describe the effects of lubrication system failures
- Contrast several lubrication systems
- Contrast the properties of common lubricating engine oils
- Identify and contrast the applications of bearing types including:
 - a. ball bearings
 - b. roller bearings
 - c. needle bearings
 - d. babbitt or bushing bearings
 - e. thrust washers or bearings
- Troubleshoot bearing and lubrication failures

Competency: Arc weld

Tasks:

- Practice welding safety practices
- Set up welder
- Complete welds in the flat position

Competency: Oxy-acetylene cut and weld

Tasks:

- Practice welding safety practices
- Set up oxy-acetylene unit
- Start and shut down unit
- Complete basic welds in flat position

Agricultural Mechanics III:

Competency: Perform general shop tasks

Tasks:

- Adjust or remove and replace seals and bearings
- Check tires for pressure, wear and defects
- Demount, repair, replace large and small tubes and tires
- Complete work orders, service invoices and requisitions
- Prepare written cost estimate of repair work and a warranty claim
- Clean machinery and equipment with a steam cleaner
- Paint tractors, machinery and equipment
- Winterize equipment



Competency: Perform basic wiring

Tasks:

- Apply fundamentals of electricity
- Make an extension cord
- Wire a switch
- Complete various electrical splices

Competency: Perform more advanced arc welds

Tasks:

- Follow welding safety practices
- Perform basic arc welds
- Weld vertically
- Weld horizontally
- Perform hand surfacing
- Weld pipe

Competency: Mig weld

Tasks:

- Follow welding safety practices
- Set up machine
- Run through Mig welder operation
- Complete Mig welds

Competency: Tig weld

Tasks:

- Follow welding safety practices
- Run through Tig welder operation
- Complete Tig welds
- Weld aluminum

Competency: Operate and service small motors

Tasks:

Identify appropriate motors for given situations based on:

a. size	e. RPM
b. enclosure	f. type of mount
c. starting load	g. drive system
d. operating load	h. control and protection devices

- Change the voltage used to operate a motor
- Change the direction of rotation of a motor
- Install a motor correctly for a specific task
- Check, clean and lubricate a motor
- Read and follow the operating and maintenance instruction in the operator's manual for motors

Competency: Operate and service small gasoline engines

Tasks:

- Choose the right engine for the job
- Troubleshoot engine failure
- Recommend parts needed for engine repair
- Lubricate all parts of the engine as specified in the operator's manual
- Remove, service, replace the breather
- Adjust for correct RPM
- Make minor repairs necessary to continue operation

Check, change and gap spark plugs
Check, replace points, condenser and coil
Mix fuel, refuel small gasoline engines
Correctly operate small gasoline engines for different tasks
Maintain a roto tiller



Competency: Operate an agricultural wheel-type tractor under field conditions

Tasks:

- Operate a tractor under field conditions
- Make remote hydraulic cylinder connections
- Connect PTO shaft from allied equipment
- Connect 3-point implements
- Follow recommended maintenance schedules
- Safely handle fuels and refuel tractor
- Hitch and unhitch tractor implements using recommended procedures and safety

Competency: Identify equipment requirements

Tasks:

- Determine equipment replacement schedule
- Identify equipment to sell or eliminate from inventory
- Project need for new or updated equipment
- Estimate cost to purchase, operate and maintain new equipment
- Compare cost, efficiency and maintenance requirements of various models and makes of equipment
- Prepare bid specification for purchase of equipment and services

Competency: Operate agricultural field equipment

Tasks:

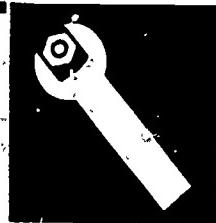
- Set up and operate planting equipment
- Adjust and operate cultivating equipment
- Harvest crops with mechanical harvesting equipment
- Operate and adjust tillage equipment
- Calibrate and operate crop spraying equipment

Competency: Adjust and repair agricultural equipment

Tasks:

- Identify types, parts and accessories of major items of agricultural equipment used in the local area, from the following list:
 - a. land preparation equipment
 - b. planting equipment
 - c. tillage equipment
 - d. fertilization equipment
 - e. harvesting equipment
 - f. weed, insect and pest control equip.
 - g. irrigation equipment
 - h. general usage farm equipment
- Assemble the items of equipment used
- Adjust items of equipment used
- Determine which item of equipment and which accessories to use
- Prepare items of equipment used for hitching to a tractor (where applicable)
- Replace damaged or worn parts of items of equipment used
- Service, lubricate items of equipment used
- Follow all operating and safety instructions and operate the items of equipment

Competency: Maintain and service fuel system



- Tasks:**
- Adjust carburetor for load and idle operation
 - Repair or replace carburetor
 - Maintain a clean supply of gasoline and diesel fuel
 - Replace fuel filters
 - Adjust governor on equipment
 - Troubleshoot diesel injection fuel system problems
 - Troubleshoot carburetor fuel system problems

Competency: Maintain and service brake systems

- Tasks:**
- Explain braking system terms, principles, and components and their functions
 - Compare the construction, operation, and servicing of drum and disk brakes
 - Remove and replace disc brake rotor
 - Remove and replace brake shoes
 - Check and service fluid level
 - Inspect brake hoses and lines
 - Rebuild wheel cylinder
 - Remove and replace caliper assembly
 - Bleed brake system

Competency: Troubleshoot gas and diesel power units

- Tasks:**
- Troubleshoot components of the engine, using recommended testing equipment
 - Service, adjust engine for proper operations

Competency: Maintain and service the ignition system

- Tasks:** Service and test/adjust/replace:
- | | |
|--------------------------------------|--|
| a. spark plugs and ignition wires | j. distributor module (electronic) |
| b. spark plug gap | m. coil |
| c. spark plug wires | n. distributor |
| d. distributor rotor, cap and points | o. automatic spark advance mechanism |
| e. ignition timing | p. glow plug |
| f. primary circuit resistance | q. automatic spark advance mechanism |
| g. ignition coil | r. ignition system using engine analyzer |
| h. secondary circuit continuity | s. worn distributor parts |
| i. glow plug electrical system | t. pickup coil (electronic) |
| j. distributor module | u. distributor |
| k. condenser | |

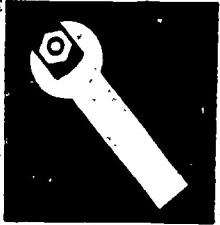
Agricultural Mechanics IV:

Competency: Service manual transmissions and differentials

- Tasks:**
- Explain transmission terms, fundamental principles, components and their functions
 - Explain clutch terms, fundamental principles, components and their functions
 - Explain differential terms, fundamental principles, components and their functions
 - Use special tools and equipment
 - Use service and repair manuals

Service and adjust/replace:

- a. clutch assembly
- b. linkage
- c. transmission/transfer case
- d. driveline, universal joints, and constant velocity universal joints
- e. differential
- f. lubricant levels and condition



(A) Overhaul/rebuild:

- a. manual transmissions
- b. transfer cases
- c. differentials

Competency: **Maintain and service clutches**

Tasks: Adjust manual clutch

Check clutch cable

Adjust hydraulic clutch free travel

Service:

- a. clutch release bearing
- b. clutch cable
- c. clutch release fork
- d. hydraulic clutch slave cylinder

Rebuild hydraulic clutch slave cylinder

Rebuild hydraulic clutch master cylinder

Competency: **Maintain and service electrical system accessories**

Tasks: Clean, tighten and treat battery terminal connection

Charge batteries

Measure the specific gravity and voltage of a battery

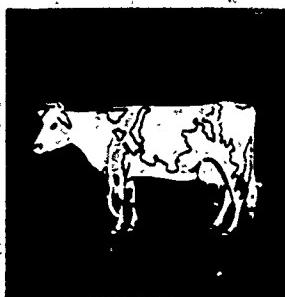
Run a load test on a battery

Troubleshoot the electrical system, using recommended testing equipment

Replace parts of electrical system components

Adjust or set all parts of system for proper operation

Animal Science



Animal Science I:

Competency: Understand principles and terms related to animal science

Tasks: Identify terms related to animal science including:

a. artery	x. dehorn	uu. ram
b. barren	y. doe	vv. ration
c. bitch	z. estrus	ww. registered
d. boar	aa. eviscerate	xx. rooster
e. breeder	bb. excrement	yy. roughage
f. broiler	cc. exotic	zz. ruminant
g. buck	dd. fetus	aaa. runt
h. bull	ee. gestation	bbb. seed stock
i. butter	ff. gosling	ccc. shoat
j. calf	gg. grade	ddd. show stock
k. calves	hh. hatchery	eee. slaughter
l. calving	ii. heat	fff. sow
m. capon	jj. milker	ggg. sow
n. carcass	kk. molt	hhh. species
o. carnivorous	ll. molt	iii. stag
p. castrate	mm. mutation	jjj. steer
q. castration	nn. parasite	kkk. strain
r. chew cud	oo. pedigree	lll. stud
s. chromosome	pp. pelt	mm. trait
t. cooperative	qq. poultry	nnn. type
u. crossbreeding	rr. prey	ooo. veal
v. cull	ss. protein	ppp. virus
w. decomposition	tt. purebred	

Competency: Select animals

Tasks:

- Identify major parts of animal anatomy
- Identify breeds of commercial animals
- Evaluate desirable conformation characteristics of animals
- List desirable characteristics of breeding animals
- Determine method of selection (judging)
- Identify wholesale cuts
- Explain reasons for selection
- Administer general first aid to animals
- Restrain and handle animals/safety
- Market animals

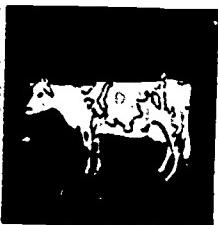
Animal Science II:

Competency: Understand animal health principles and common diseases

Tasks:

- Identify health principles and common diseases of animals
- Identify disorders associated with feeding (bloat, colic, mold)
- Identify symptoms of stress in animals
- Control insects, diseases and parasites

Treat common animal diseases and disorders
Identify infestations of animal internal and external parasites
Treat animals for internal and external parasites
Develop and manage a schedule of preventive medication
Clean and disinfect trailers, pens, and other animal holding equipment
Identify and follow regulations regarding the use of pesticides and medications on breeding and slaughter animals
Read and follow directions on pesticide labels and medication containers
Restrain animals
Castrate animals



Competency: Feed animals

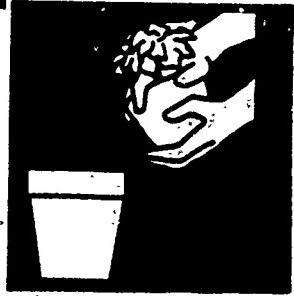
Tasks: Prepare a feeding schedule
Categorize major animal food groups and explain function
Identify feeds
Determine nutritional requirements of animals
Distinguish between ruminants and non-ruminants
Determine nutritional value of feedstuffs
Maintain a fresh, clean water supply for animals
Mix feed and feed animals
Balance a feed ration
Store feed
Calculate cost of gain per pound for different feed rations

Animal Science III & IV:

Competency: Manage animals

Tasks: Select appropriate animal enterprise, considering:
a. breed
b. scope
c. market strategy
Compare breeding methods
Care for newborn animals
Manage grazing animals on the range
Identify ecological impacts of grazing animals
Manage forage on the range
Maintain animal health
Maintain production, personnel and business records, including:
a. budget
b. business agreement
c. journal of monthly expenditures and income, outlays for labor etc.
d. inventory
e. cash flow
Analyze contracts, leases and other legal documents
Construct, repair and maintain facilities and equipment
Exhibit and market animals

Plant Science



Plant structure, function, growth, and reproduction

Competency: Recognize basic parts of plants and their functions

Tasks: Identify meanings for plant-related terminology including.

- | | | |
|-------------------------|-----------------------|-------------------------|
| a. adhesion | v. erosion | qq. phloem |
| b. aerobic | w. evaporation | rr. phosphorus |
| c. angiosperm | x. fats | ss. photosynthesis |
| d. annual | y. fermentation | tt. pollination |
| e. asexual reproduction | z. fibrous | uu. respiration |
| f. biennial | aa. filament | vv. rhizome |
| g. blade | bb. fruit | ww. rhizomes |
| h. broadcast | cc. fungi | xx. scion |
| i. bud | dd. fungicide | yy. sexual reproduction |
| j. bulb | ee. genus | zz. starch |
| k. calcium | ff. germination | aaa. stolons |
| l. carbohydrates | gg. glucose | bbb. sugar |
| m. cell | hh. layering | ccc. sulfur |
| n. cellulose | ii. mutation | ddd. tap roots |
| o. cereal | jj. natural selection | eee. taproot |
| p. compound | kk. necrosis | fff. tissue |
| q. crown | ll. nectar | ggg. transpiration |
| r. cuticle | mm. oxidation | hhh. urea |
| s. diffusion | nn. oxygen | iii. variety |
| t. embryo | oo. parasite | jjj. virus |
| u. enzyme | pp. petioles | kkk. xylem |

Identify the role of flowers and fruits in plant reproduction

Identify basic plant parts and processes, including:

- | | |
|-------------------|------------------|
| a. bract | h. pistil |
| b. cambium | i. respiration |
| c. chlorophyll | j. stamen |
| d. dicot | k. transpiration |
| e. epidermis | l. xylem |
| f. phloem | |
| g. photosynthesis | |

Competency: Recognize plants by growth habits

Tasks: Identify growth habits of leaves including:

- | | |
|--------------------|------------------|
| a. compound leaves | c. leaf blades |
| b. simple leaves | d. leaf petioles |

Identify growth habits of roots including:

- a. tap roots
- b. fibrous roots

Identify growth habits of plant stems, flowers and fruits

Identify methods of plant reproduction

Plant Taxonomy



Competency: Use plant keys

- Tasks:**
- Use botanical nomenclature and classification
 - Differentiate among alternate, opposite and whorled leaf arrangements
 - Differentiate among parallel, pinnate, and palmate venation
 - Identify plants by flowers
 - Differentiate among annual, biennial, and perennial plants

Competency: Classify plants

- Tasks:**
- Identify the system of plant taxonomy including the levels of classification:
 - a. kingdom
 - b. division
 - c. class
 - d. subclass
 - e. order
 - f. family
 - g. genus
 - h. species
 - i. cultivar
 - Identify common Alaskan edible and poisonous plants
 - Classify various agronomic and horticultural plants
 - Explain U.S. government grades for agricultural products

Plant Environment

Competency: Understand the nature and properties of soils

- Tasks:**
- Identify the importance of soil to living things
 - Describe major characteristics of soil, including:
 - a. texture
 - b. structure
 - c. pH
 - d. fertility
 - e. cation exchange capacity (CEC)
 - f. productivity
 - Identify the role of soil organisms
 - Identify the role of soil atmosphere
 - Identify ways that soil is modified for plant growth, including the use of:
 - a. soil mixtures
 - b. soil mulches
 - c. soil-less media
 - Analyze soil
 - Explain the role of fertilizer for plants
 - Identify the role of soil moisture

Competency: Understand influence of moisture, light, temperature, and air

- Tasks:**
- Explain plant absorption of water
 - Explain the role of light quantity, quality, and duration in plant growth and reproduction
 - Explain the role of temperature on plant growth and reproduction

Competency: Understand how to control plant growth

- Tasks:**
- Explain ways to control plant growth, including:
 - a. pruning
 - b. thinning
 - c. chemical application (growth retardants, etc.)

- Explain reasons for controlling plant growth including:**
- a. economic
 - b. aesthetic
 - c. special effects
 - d. research
- Identify techniques and purposes of pruning and thinning**
- Identify techniques and purposes of disbudding and pinching**
- Identify ways and purposes of controlling temperature for plant growth**
- Identify ways and purposes of chemical control of plant growth**



Plant Health

Competency: Understand characteristics of a healthy plant

- Tasks:** Point out healthy plant characteristics such as:
- a. erectness
 - b. healthy leaves
 - c. plant size
 - d. plant odor
 - e. plant wounds
 - f. color or general appearance

Identify characteristics of plant disorders

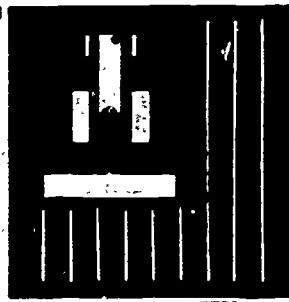
Examine plants for good health

Explain ways to cultivate healthy plants

Competency: Understand environmental factors causing plant disorder

- Tasks:** Identify the importance of appropriate plant moisture
- Explain the perils of over watering and under watering
- Identify when to water and ways to water plants
- Identify the importance of maintaining proper :
- a. relative humidity
 - b. light conditions
 - c. temperature
- Identify primary plant nutrients
- Explain the role of chemicals in plant growth
- Identify mechanical and cultural plant disorders
- Map out a plant management plan

Soil Science/Agronomy



Soil Science/Agronomy I:

Competency: Understand the function of soils

Tasks: Identify terms related to soil, including:

- | | | |
|-----------------------------|-----------------------|-------------------|
| a. aeration | i. infiltration | w. silt |
| b. aggregate | m. inorganic | x. slope |
| c. cation exchange capacity | n. loam | y. soil profile |
| d. clay | o. loess | z. soil structure |
| e. contour | p. nature of soil | aa. solum |
| f. drainage | q. organic | bb. subsoil |
| g. erosion | r. permeability | cc. terrace |
| h. fertility | s. productivity | dd. texture |
| i. fertilizer | t. properties of soil | ee. tilth |
| j. hardpan | u. runoff | ff. topography |
| k. impervious soil | v. sand | gg. true soil |

Identify the components of soil including:

- | | |
|--------------------|--------------------|
| a. soil atmosphere | c. parent material |
| b. soil moisture | d. soil organisms |

Explain how soil is formed

Identify the importance of soil

Describe primary soil microorganisms

Describe the water-holding capacity of soil

Describe the role of soil organic matter

List soil texture groups

Describe how soils are classified

Identify types of soil by color, structure, texture and soil profile analysis

Soil Science/Agronomy II:

Competency: Understand physical and chemical properties of soil

Tasks: Identify chemical components of soil

Explain effect of plant nutrients, nitrogen, phosphorus, and potassium on growth

Explain the significance of soil organisms to growth

Analyze soil conditions, including:

- | | |
|-----------------|----------------------|
| a. soil acidity | f. depth of bedrock |
| b. pH | g. slide potential |
| c. phosphorus | h. organic content |
| d. potassium | i. degree of erosion |
| e. nitrogen | |

Interpret analysis of soil samples

Interpret basic soil differences

Make borings and vegetative studies of wet areas

Interpret results of soil test

Prescribe fertilizer based on test results and cultural practices

Calculate cost per pound of various fertilizers

Soil Science/Agronomy III:

Competency: Understand properties of the soil profile

Tasks:

- Measure available water holding capacity
- Measure water intake rate
- Measure effective soil depth
- Identify classifications of salt and sodium content of soil

Competency: Understand land capability

Tasks:

- Determine type of crop and proper management
- Determine range use and capability
- Explain urban land uses
- Determine the best use of lands including:
 - a. appraising land
 - b. evaluating income potential
 - c. identifying government policies and regulations
 - d. land capability classification

Competency: Use soil surveys

Tasks:

- Obtain local soil survey
- Identify uses of land according to soil
- Develop a conservation plan

Competency: Utilize land descriptions

Tasks:

- Define:
 - a. ac
 - b. sec
 - c. acreage
- Pace off land
- Determine acreage
- Read land descriptions
- Complete a land description
- Measure and record land topography
- Describe the Land Capability Classification System
- Survey land: *For competencies and tasks in surveying see "Land, Air, and Water," and "Forestry" sections.*

Soil Science/Agronomy IV:

Competency: Use soil conservation and management techniques

Tasks:

- Explain the effects of wind, water, and temperature on soil
- Identify the system of land capability classification including capability classes and subclasses

Competency: Test soil



Tasks: Identify terms related to soil testing, including:

- | | |
|-----------------------|-------------------|
| a. nature of soil | h. organic |
| b. properties of soil | i. inorganic |
| c. parent material | j. tilth |
| d. topography | k. permeability |
| e. solum | l. soil structure |
| f. true soil | m. aggregate |
| g. aeration | |

Identify the composition of soil including using color, structure and texture

Take soil sample

Collect test pit information for building purposes

Interpret basic soil differences

Make borings and vegetative studies of wet areas

Analyze soil, including items as:

- | | |
|-----------------|----------------------|
| a. soil acidity | f. depth of bedrock |
| b. pH | g. slide potential |
| c. phosphorus | h. organic content |
| d. potassium | i. degree of erosion |
| e. nitrogen | |

Interpret analysis of soil samples

Horticulture

(A) Denotes more advanced competency or task.



Ornamental Horticulture

Competency: Understand terms and definitions related to ornamental horticulture

Tasks: Define terms related to ornamental horticulture including:

- | | | |
|-----------------|-------------------|-------------------|
| a. agronomy | i. epidermis | w. pollen |
| b. botany | m. fungi | x. primary root |
| c. budding | p. horticulture | y. propagation |
| d. bulbs | q. layering | z. prune |
| e. chlorophyll | r. leaf cuttings | aa. respiration |
| f. chloroplast | s. nodes | bb. rhizomes |
| g. cold frames | t. ornamentals | cc. root |
| h. conditioning | u. pesticide | dd. stolons |
| i. corms | v. photosynthesis | ee. transpiration |
| j. cutting | n. fungicide | |
| k. enzymes | o. herbicide | |

Competency: List types of ornamental horticulture businesses

Tasks: Identify work in the fields of:

- | | |
|---------------------------|-------------------|
| a. interior plantscaping | d. garden centers |
| b. floriculture | e. nurseries |
| 1. commercial greenhouses | |
| 2. retail florists | |
| c. turf management | |

Identify opportunities in the ornamental horticulture business in Alaska

Competency: Classify, identify and determine the functional uses of ornamental plant materials

Tasks: Classify plants according to growth habit-- temperature, water, light, etc

Classify plants according to taxonomy

Identify plants according to scientific and common name

Identify ornamentals acclimatized to Alaska

Select plant materials for specific use

Differentiate among annuals, biennials, and perennials

Differentiate among annuals, biennials and perennials, for bulbs, corms, roses, and grasses

Recognize the following selection factors for each flower, shrub, tree, and grasses:

- | | |
|---------------------|-------------------|
| a. height | d. bloom sequence |
| b. leaf color | e. leaf shape |
| c. berries or fruit | |

Differentiate between woody and herbaceous plants

Identify indigenous Alaska-specific species appropriate for landscaping

Competency: Value attractive lawns and turf

- Tasks:**
- Explain the value of an attractive lawn
 - Explain the importance of the turf industry to state and local economies
 - Explain effects of turf grasses on the environment
 - Explain the role of turf in places such as parks, playgrounds, and golf courses



Competency: Understand state and federal regulations related to the operation of a horticulture business

- Tasks:**
- Observe local, state and federal pesticide regulations
 - Observe nursery site regulations
 - Observe and interpret marketing restrictions and agreements
 - Interpret and observe certification, licensing and inspection requirements
 - Identify agencies, governmental laws, and regulations affecting the horticulture industry
 - Maintain file of technical information, periodicals and other publications
 - Determine sources of up-to-date information and services
 - List societies, organizations, and associations related to horticulture
 - Observe local, state and federal regulations regarding the movement of plant materials
 - Observe EPA pesticide use regulations
 - Observe site regulations and ordinances

Competency: Prepare a landscape plan

- Tasks:**
- Complete the landscape design on paper
 - Select plants for the landscape plan, including:
 - a. trees
 - b. shrubs
 - c. herbaceous plants

Competency: Understand the role of soil fertility in ornamental horticulture

- Tasks:**
- Describe physical, chemical, and biological components of soil
 - Explain effect of plant nutrients, nitrogen, phosphorus, and potassium on plant growth
 - Take soil samples; interpret analysis

Competency: Prepare a site for landscaping

- Tasks:**
- Operate soil preparation equipment:
 - a. rototiller
 - b. shredder
 - Mix in organic and inorganic additives by following prescribed procedures
 - Prepare and apply soil mulches appropriate to the local area

Competency: Use specific tools in planting

- Tasks:**
- Use planting and transplanting tools including:
 - a. shovel
 - b. hoe
 - c. rake
 - d. hose
 - e. braker
 - f. stake
 - g. wheelbarrow
 - h. shears

Competency: Operate and maintain lawn maintenance equipment



Tasks: Demonstrate the operating and maintenance procedures of:

- a. hand or power aerifiers
- b. mowing machines
- c. turf sprinklers
- d. fertilizer spreader
- e. seeder
- f. chemical applicators

Operate and maintain:

- a. mowing machines
- b. turf sprinklers
- c. hand or power aerifiers
- d. pesticide applicators

Competency: Prepare growing media and seedbeds

Tasks: Identify media materials

Use soil conditioner

Mix rooting and growing media according to plant requirements

Sterilize media

Adjust pH level of media

Collect a soil sample from field and potting medium

Apply sanitation practices when handling and storing plant media materials

Identify and describe common soil amendments

Select and apply appropriate soil amendments

Use prepared soil mixtures following prescribed procedures

Mix and prepare soil mixtures with specific characteristics for a given application

Identify the water-holding capacity of various soils

Describe and demonstrate techniques for improving water holding capacity

Fill and level benches and pots with media

Competency: Handle plants upon arrival

Tasks: Store plants temporarily

Store plants long-term

Revive weakened plants

Competency: Plant shrubs and trees

Tasks: Use approved planting techniques

Use a shovel

Use a backhoe (if applicable)

Utilize Alaska Native plants as applicable

Competency: Plant and maintain turf

- Tasks:**
- Explain the importance of sulfur and lime to turf health
 - Select turf grass seed, especially cool climate varieties
 - Seed or sod a lawn
 - Care for new turf grass
 - Maintain established lawn



Competency: Maintain landscape site

- Tasks:**
- Fertilize plants
 - Irrigate plants
 - Weed site
 - Mow site
 - Stake and guy plants
 - Control diseases and pests
 - Prune plants
 - Thin plants

Competency: Apply fertilizer

- Tasks:**
- Collect soil and leaf tissue samples for analysis
 - Interpret and evaluate soil and leaf tissue sample analysis
 - Interpret information on a fertilizer label
 - Describe types and kinds of fertilizer materials
 - Prescribe fertilizer based on test results
 - Describe methods of distributing fertilizer
 - Apply fertilizers in liquid form
 - Apply dry fertilizer materials
 - Evaluate influences various nutrients have on plant growth
 - Identify nutrient deficiency symptoms in growing plants
 - Recognize symptoms of fertilizer burn
 - Store fertilizers
 - Calculate cost per pound of various fertilizers

Competency: Control pests and diseases

- Tasks:**
- Identify symptoms of pests affecting plants
 - identify common plant pests
 - Recognize symptoms of plant damage by insects and related pests including:
 - a. aphids
 - b. whiteflies
 - c. scale
 - d. thrips
 - e. spider mites
 - Recognize symptoms of plant diseases including:
 - a. bacterial
 - 1. rotting
 - 2. wilting
 - 3. leaf spotting
 - b. fungal
 - 1. rotting
 - 2. mildew
 - 3. leaf spotting
 - 4. rusts
 - c. viral
 - 1. mottle
 - 2. stunt
 - 3. chlorosis



- Identify common plant pests
- Classify insects according to feeding habits
- Describe life cycle of common plant pests
- Identify plant disease symptoms and causal agents
- Describe methods of controlling pests (biological, chemical, and cultural)
- Interpret information on a pesticide or agricultural chemical label
- Use pesticides safely
- Dispose of pesticide containers safely
- Interpret and use spray compatibility chart
- Identify and apply selective and non-selective herbicides
- Mix and apply pesticides
- Control weeds by chemical and mechanical means
- Identify herbicide spray damage
- Clean, adjust and calibrate spray equipment
- Determine appropriate time to apply agricultural chemicals
- Select and identify pesticides according to killing action (stomach, contact, foliar, systemic)
- Recognize symptoms of pesticide poisoning and provide first aid
- Apply soil fumigants

Competency: Prune ornamentals.

Tasks:

- Identify methods of pruning plants to achieve desired growth
- Identify and select chemical growth regulators
- Identify appropriate time to prune plants
- Root prune appropriate plants
- Prune foliage of plant materials for desired shape and growth

Competency: Irrigate ornamentals

Tasks:

- Identify irrigation needs of plants
- Identify irrigation equipment appropriate for kind and type of plant
- Set up a system to irrigate plants
- Irrig. ... plants

Competency: Handle shipment packing, temporary storage, and unpacking of plants

Tasks:

- Unpack crates and boxes
- Bunch, pack and wrap plants
- Count, assemble and load plants on vehicle

Competency: Harvest and market nursery stock

Tasks:

- Dig, ball and burlap small trees of field grown plants
- Prepare plants in an attractive display
- Maintain a clean and attractive merchandising area
- Take telephone orders
- Label and merchandise plants
- Greet customers
- Describe care and use of plants to customers
- Use sales catalogs
- Maintain knowledge of plant inventory in nursery

Competency: Perform special ornamental management practices



- Tasks:**
- Identify methods of pruning, shaping and training
 - Prune roots
 - Prune foliage and nursery plants
 - Select appropriate time to prune and train plants
 - Train plants for special effects
 - Select chemical growth regulators
 - Shape hedges
 - Protect plants from cold damage
 - Prepare plants for cold hardiness

Competency: Irrigate ornamental plants

- Tasks:**
- Determine irrigation requirements
 - Plan irrigation system
 - Install irrigation equipment

Competency: Design a lawn maintenance plan

- Tasks:**
- Plan and carry out a lawn maintenance plan, determining:
- a. mowing frequency
 - b. mowing height
 - c. watering schedule
 - d. fertilizer types
 - e. frequency of fertilizer application
 - f. frequency of weed control
 - g. needed lawn renovations
- Plan and maintain athletic fields
Maintain golf courses

Competency: Design and install interior plantscaping

- Tasks:**
- Determine desired effect and purpose of interiorscape
 - Identify plant materials appropriate for interiorscape
 - Analyze environmental conditions of site for interiorscape
 - Analyze area for plantscape
 - Determine desired effect and purpose of plantscape
 - Design plantscape plan

Competency: Consider special characteristics of Alaska's climate

- Task:**
- Distinguish between micro and macro climates
- Identify:
- a. growing-degree days
 - b. frost-free days
 - c. ambient temperature
 - d. soil temperature
- Relate photo period to plant hardiness

Floriculture

Competency: Define terms and principles of floriculture

- Tasks:**
- Identify terms related to floriculture
 - Identify and classify major floral plants
 - Identify floriculture ventures in Alaska including:
- a. retail
 - b. wholesale
 - c. maintenance
 - d. brokerage

Identify types of crops including:

- a. bedding plants
- b. foliage plants
- c. flowering potted plants
- d. cut flowers

Identify common floriculture plants, including those endemic

Differentiate among types of floriculture plants

Identify desirable and non-desirable plants in the floriculture industry

Identify floriculture pests



Competency: Plan the floriculture venture

Tasks: Plan:

- a. recommended varieties for the locale
- b. production scheme
- c. water management
- d. fertilizing
- e. planting schedule
- f. harvest schedule
- g. storage of product
- h. distribution and marketing

Competency: Prepare the growing medium

Tasks: Identify growing media and amendments

Determine appropriate soil medium for specific plants

Pasteurize soil and evaluate chemical and biological effects

Prepare compost

Mix fertilizer into media

Shred or screen media as needed

Prepare seedbed by hand or power methods

Monitor pH and soluble salts

Competency: Propagate plants

Tasks: Propagate plants by asexual means:

- a. cutting
- b. grafting and budding
- c. layering
- d. micropropagation (tissue culture)
- e. division

Propagate plants sexually (seeds or spores)

Competency: Manage the crop

Tasks: Cultivate plants as necessary

Thin stands as necessary

Water plants

Apply mulches as appropriate to local area

Control pests

Fertilize as recommended for locale and variety

Protect crops from predators

Utilize conservation practices

Competency: Perform special management practices



- Tasks:**
- Pot plants
 - Pinch flowering plants
 - Disbud flowering plants
 - Prune plants
 - Train and shape plants
 - Apply growth-regulating chemicals
 - Use post-harvest preservatives as necessary

Competency: Use special harvest methods

- Tasks:**
- Cut flowers or foliage
 - Count, grade and bunch flowers or foliage

Competency: Design with flowers and foliage

- Tasks:**
- Condition cut flowers
 - Prepare boutonnieres or corsages
 - Prepare cut flower containers
 - Construct a line arrangement
 - Complete a floral arrangement
 - Design a simple floral centerpiece
 - Design a Christmas arrangement
 - Construct a dish garden or terrarium
 - Complete a product display

Competency: Sell products

- Tasks:**
- Greet customers
 - Help customers select products
 - Take telephone orders
 - Operate cash register
 - Cash out register

Vegetable and Fruit Production (Olericulture)

Competency: Define basic olericulture terms and techniques

Tasks: Identify terms such as:

- | | | |
|---------------|-------------------|-------------------|
| a. adapted | r. nematode | aa. seedling |
| b. broadcast | s. organic matter | bb. shading |
| c. cold frame | t. pasteurization | cc. site |
| d. compost | u. pesticides | dd. slope |
| e. enzyme | v. pH | ee. sterilization |
| f. fertility | w. pruning | ff. toxic |
| g. flat | x. rotation | gg. transplanting |
| h. fungicides | y. sake | hh. variety |
| i. furrow | z. seedbed | ii. weed |
| j. hardy | n. implement | |
| k. harvesting | o. insecticides | |
| l. herbicides | p. irrigation | |
| m. hotbed | q. mulch | |

Competency: Assess the potential for personal use and commercial agriculture

Tasks: List crops and varieties grown in local area
Identify markets for locally-grown products
Describe local desirable and undesirable plants
Describe food storage procedures such as using root cellars



Competency: Plan the operation

Tasks: Determine length of growing season
Determine rainfall and air and soil temperature parameters during growing season
Plan crop and variety location
Test soil
Determine vegetable production procedures and recommended varieties for your locale

Plan:

a. irrigation and drainage	e. harvest schedule
b. fertilizing	f. storage schedule
c. pest management	g. distribution & marketing
d. planting schedule	

Competency: Prepare the growing medium

See Floriculture for tasks for this competency.

Competency: Plant crops

Tasks: Plan planting schedules
Label plants
Plant crop
Transplant seedlings
Identify problems related to seeding failures

Competency: Manage crop production

Tasks: Cultivate plants as necessary
Thin stands if necessary
Water plants as necessary
Apply mulches appropriate for local climatic area
Identify and control pests
Assess and correct plant nutrient deficiencies
Fertilize as recommended for locale and variety
Protect crops from predators

Competency: Control pests and diseases

Tasks: Identify pests and diseases
Safely select appropriate chemical for crops, especially edible ones
Apply pesticide spray
Apply pesticide dust or granular pesticide
Recognize symptoms of pesticide poisoning and provide first aid
Use, store, and discard chemicals safely
(A) Obtain pesticide applicator's license

Competency: Harvest crops



- Tasks:**
- Determine stages of maturity
 - Utilize appropriate harvest method
 - Classify and grade vegetables for market purposes
 - Determine yield and losses
 - Calculate actual returns and profits from sales
 - Process and store crop for desired use such as:
 - a. freezing
 - b. canning
 - c. drying/dehydrating
 - d. field storing
 - e. root cellaring
 - f. shipping
 - Prepare crop for display

Greenhouses

Competency: Understand principles of greenhouse management

- Tasks:** Identify terms and concepts related to greenhouses, including:
- a. angle of incidence
 - b. cold frames
 - c. flats
 - d. foot candle
 - e. glazing
 - f. hot beds
 - g. lath houses
 - h. raised beds
 - i. shading
 - j. thermal blankets
- Describe and evaluate greenhouse framing materials
- Describe purposes of greenhouses
- Identify different types of greenhouses, including:
- a. commercial greenhouses
 - b. cold frames
 - c. hot beds
 - d. home greenhouses
 - e. conservatories
- Identify how and when various plant growing structures can be used
- List the specialized structures used in the greenhouse business

Competency: Plan, construct, and maintain greenhouse physical facility

- Tasks:** Identify factors involved in greenhouse construction and layout
- Determine:
- a. orientation of greenhouse
 - b. angle of incidence
 - c. size of materials needed for construction
 - d. amount of materials needed
- Diagram a sun path
- Identify greenhouse sunspace demands
- Make a greenhouse layout plan
- Construct, maintain and repair a greenhouse, including:
- a. reading and interpreting blueprints
 - b. building and removing concrete forms
 - c. mixing, pouring, finishing, and curing concrete
 - d. laying concrete blocks
 - e. installing and repairing bracing in greenhouse
 - f. repairing and hanging gates and doors
 - g. applying wood and metal preservatives
 - h. cleaning and oiling electric motors on structures
 - i. constructing and repairing benches and frames

- j. selecting lights according to crop needs
- k. installing and servicing sprinkler heads, pipe nozzles and other irrigation equipment
- l. painting greenhouse and other structures and equipment
- m. repairing minor leaks in roof of greenhouse
- m. replacing plastic coverings on temporary structures
- n. washing greenhouse glass
- o. replacing glass
- p. operating and maintaining heating and cooling systems
- q. determining costs of repairs
- r. developing bill of materials

Construct and repair fences and gates

Install and repair wood siding on buildings and storage bins

Repair metal structures with arc or oxy-acetylene welder



Competency: Identify, select, operate, and maintain greenhouse equipment

Tasks: Identify the uses of specialized structures in the greenhouse

Clean heating system

Install:

- | | |
|------------------------|---------------|
| a. electric motors | c. water pipe |
| b. electrical switches | |

Repair electrical cords and broken wires

Replace:

- | | |
|---|---------------------------------------|
| a. belts and pulleys | e. faucets |
| b. fuses | f. traps in greenhouse heating system |
| c. lighting fixtures | |
| d. valves in water system and water lines | |

Reset circuit breakers

Wire simple electrical circuit

Competency: Control greenhouse environment

Tasks: Identify factors of greenhouse environment, including:

- | | |
|----------------|---------------------|
| a. humidity | d. light |
| b. temperature | e. water/irrigation |
| c. ventilation | |

Explain why light is important to horticultural crops

Explain the effect of extremely intense sunlight on plants

Explain how light can be controlled in a greenhouse

Interpret light meter readings

Determine light intensity

Select appropriate type of artificial lighting

Set automatic light timers

Install black cloth to regulate photoperiod

Apply shading compound to greenhouse glass

Explain the effect of temperature on plants

Identify methods of controlling temperature in the greenhouse

Determine appropriate temperatures for various plants

Control air temperature

Adjust automatic cooling system

Evaluate the effect temperature has on plants

Identify types of moisture conditions important in greenhouse management

Explain the importance of humidity in the greenhouse

Control humidity

Evaluate the influence relative humidity has on plant growth

Control greenhouse water

Understand the importance of air movement in greenhouses

Control air movement

Alter spacing of plants

Hang lath or saran cloth

Regulate carbon dioxide generating equipment

Set timers



Competency: Produce greenhouse crops

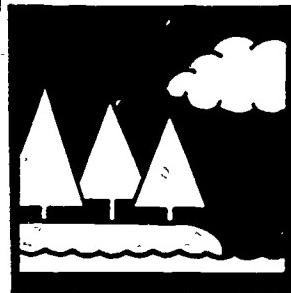
Tasks: Prepare the greenhouse growing medium, including

- a. identifying greenhouse growing media and amendments
- b. determining appropriate soil medium for specific plants
- c. preparing compost
- d. shredding or screening media as needed
- e. pasteurizing soil and evaluate chemical and biological effects
- f. monitoring pH and soluble salts

For other tasks related to producing greenhouse crops, refer to Floriculture, Vegetable/Fruit Production, and Ornamental Horticulture areas

Land, Air and Water Management

(A) Denotes more advanced competency or task.



I. Work with the Resource.

Competency: List employment and educational opportunities in fields related to land, air, and water

Tasks:

- Identify educational and occupational opportunities
- Locate resources for finding employment
- Identify prospective employers
- Identify the work of:
 - a. soil conservation officer
 - b. air quality technician
 - c. water quality technician
 - d. waste treatment plant operator

Program SOEP (Coop or OJT) in interest area

II. Use the Resource.

A. Read maps, surveys, and determine land status.

Competency: Use a map projection

Tasks:

- Differentiate between globes and maps
- Explain how the following are produced:
 - a. cylindrical projection
 - b. conic projection
 - c. polyconic projection
 - d. plane projection

Competency: Use a compass

Tasks:

- Read magnetic bearings
- Explain declination, variation and deviation
- Adjust compass
- Find compass error and make compass corrections
- Determine azimuth
- Define orientation terms
- Follow a map using a compass

Competency: Interpret maps

Tasks:

- Define mapping terms including those relating to public lands
- Orient map
- Locate and read meridians
- Locate and read latitude and base line
- Interpret public lands scales and contour lines
- Read contour maps
- Make a contour map from data
- Draw a simple profile



Identify range lines and township lines
Identify sections
Identify divisions of sections
Locate properties by coordinates
Determine land ownership and status
Locate and identify field boundaries
Use topographical and aerial photographs
Record acreage in field by making measurements
Interpret legal land descriptions
Prepare land capability maps from soil maps and data

Competency: Measure horizontal distances

Tasks: Use:

- a. chains
- b. philadelphia rods
- c. transits
- d. compasses
- e. theodolites
- f. E.D.M.'s
- g. hand level or engineering level

Define horizontal distance skills
Measure distances with a surveyor's tape
Make linear corrections for temperature
Calculate proper tape tension to use
Make linear corrections for slope
Read tapes
Take taping notes
Use surveying signals and numbers
Determine volumes of earth
Locate best site for engineering practices

Competency: Measure vertical distances

Tasks:

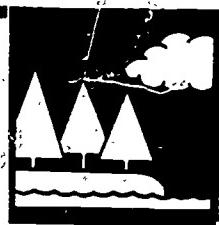
- Define terms related to vertical distances
- Read a philadelphia rod using vernier
- Set up and level a transit-level
- Make accurate rod readings through level
- Complete differential level to closure
- Make site survey
- Perform duties of rod person
- Perform duties of instrument person
- Measure degree of slope

Competency: Measure angles

Tasks:

- Define angle measuring skills
- List parts of a transit
- Set up and read transit
- Measure angles
- Use tripod
- List parts of Theodolite (K&E)
- Set up Theodolite
- Measure horizontal angles with Theodolite
- Compute traverse computations
- Complete stadia survey

Competency: Record surveying data



- Tasks:**
- Define surveying terms relating to recording data
 - Keep daily record of work accomplished
 - Maintain plan records
 - Write reports
 - Prepare requisitions
 - Keep personnel records and information
 - Record field data
 - Take surveying notes for the following:
 - a. horizontal distance
 - b. differential level
 - c. repeating angles
 - Describe the impact of errors of accuracy and closure

Competency: Assist surveyor

- Tasks:**
- Mark measuring points with paint, sticks or stakes
 - Measure distances between survey points
 - Cut or clear brush from survey lines
 - Hold level rod or stadia rod at designated points
 - Move rod or target following hand or verbal signals
 - Call out reading to note keeper or record information
 - Set up and care for surveyors equipment and supplies
 - Read maps aerial photographs and legal descriptions
 - Measure acreage
 - Use photo scales
 - Record measures on photos or in records
 - Make rough tracings of maps
 - Interpret a real estate or land descriptions
 - Determine locations and other information from maps

Competency: Determine land status

- Tasks:**
- Identify terminology portraying land status
 - Read and write legal land descriptions
 - Use a lands record system
 - Describe how to procure simple easements

B. Test soil.

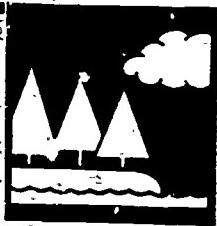
Competency: Test soil

For tasks in soil testing, see Soil Science/Agronomy IV.

C. Test water.

Competency: Test and treat water

- Tasks:**
- Collect water samples
 - Test water for minerals
 - Test water for turbidity
 - Interpret analysis of water samples
 - Test streams and ponds
 - Microbiologically test water



- Apply principles of water purification
- Apply the microbiology of water purification
- Identify safe procedures for the operation of chlorinators
- Treat water taste and odor problems
- Prevent corrosion problems
- Set up fluoridation systems
- Prevent cross connections and backflow
- Prevent water pollution

Competency: Meet drinking water standards and abide by regulations

Tasks: Monitor contaminant levels

- Monitor microbiological quality of drinking water
 - Monitor chemical quality of drinking water
 - Monitor radionuclides of drinking water

Competency: Produce potable water

Tasks:

- Identify quality of water required and necessary treatment
 - Describe the characteristics of and use coagulants
 - Identify and use several different types of water filters
 - Describe the characteristics of softeners
 - Identify the purposes of aeration equipment
 - Treat for parasites and disease
 - Remove toxic chemicals

Competency: Make calculations and measurements in hydraulics

Tasks:

- Identify principles of hydrology and water quality control
 - Calculate pressure in P.S.I.
 - Explain the principles of water at rest
 - Demonstrate principles of fluid flow
 - Measure fluids
 - Measure electricity
 - Calculate water volume
 - Use ratios, percentages, p.p.m. and constants to solve problems dealing with water
 - Describe water use and development

Competency: Understand water use laws in Alaska

Tasks: **Define:**

- a. riparian water rights
 - b. prior appropriation
 - c. irrigational and municipal water laws
 - d. navigational water rights
 - e. seashore water rights
 - f. instream use rights

D. Test air.

Competency: Understand components of the atmosphere

Tasks: Identify gases in the atmosphere including:

- a. oxygen
- b. nitrogen
- c. carbon dioxide

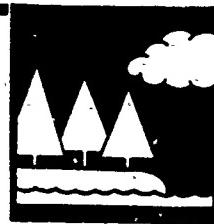
Identify layers of the atmosphere including:

- a. troposphere
- b. stratosphere
- c. mesosphere
- d. thermosphere
- e. ionosphere

Explain how the atmosphere is heated

Contrast conduction, convection, and radiation

Explain the greenhouse effect



Competency: Sample gases for ambient particulate level

Tasks: Sample air using:

- a. high volume sampler
- b. cascade impactor
- c. dustfall collector
- d. adhesive impactor
- e. tape spot sampler
- f. five gas sampler
- g. lead peroxide candle

Maintain the above test equipment

Use accessory equipment related to the above samples including:

- a. scales
- b. driers

Competency: Evaluate sources of combustion

Tasks: Determine density or opacity of smoke from combustion sources by using the Ringlemann-type Smoke Chart

Determine density or opacity of smoke from combustion sources by using the calculation method designed by the U.S. Bureau of Mines

Use the following instruments used in evaluating combustion:

- a. draft gauge
- b. thermometer
- c. carbon monoxide indicator
- d. carbon dioxide indicator

(A) Competency: Select and install air pollution sampling equipment

Tasks: Select sites for installing gaseous and particulate samplers

Select sites for installing wind instruments, paying attention to:

- a. location on or near a building
- b. location in a rural area

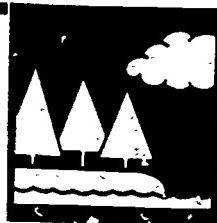
Secure and maintain sampling equipment by:

- a. providing a stable base
- b. providing electrical power
- c. protecting sampling station from vandalism

Competency: Record and analyze particulate and gaseous sampler data

Tasks: Record data from:

- a. dustfall collector
- b. high volume sampler
- c. tape spot sampler (gas and particulate)
- d. five-gas sampler
- e. lead peroxide candle
- f. cascade impactor
- g. adhesive impactor



Satisfy requirements of the Standard National Air Surveillance Network (N.A.S.N.) form

Use equipment to analyze samples; including:

- a. gruber comparator
- b. tape spot evaluator
- c. muffle-type laboratory furnace

Complete air quality reports

Competency: Understand the effects of topography and weather on air pollution

Tasks: Identify weather factors conducive to high air pollution potential

Identify the effects of topographical types on the transportation and diffusion of pollutants in a local area

Use instruments to record wind behavior including:

- a. wind vanes
- b. wind anemometers
- c. dual-channel strip-chart recorders

Predict breakups or occurrences of air inversions according to weather forecasts and wind sensors

Explain "heat island" and "haze dome" effects and their relationship with air pollution

Competency: Evaluate odors

Tasks: Determine odor sources for specific odors

Rate odors using a standard odor quality scale

Rate the intensity of odors using the Psychophysical Intensity Scale

Complete an odor patrol report form concerning a community odor

Complete a community odor survey and evaluate its results

Competency: Test noise

Tasks: Use a sound-level (decibel meter)

Read fluctuations in noise level on the decibel meter

Explain federal and state regulations related to noise pollution

Evaluate a residential sites' exposure to transportation noise

Evaluate an air operations area's exposure to transportation noise

III. Manage and Protect the Resource.

Competency: Protect land resources

Tasks: List steps in establishing a sanitary landfill

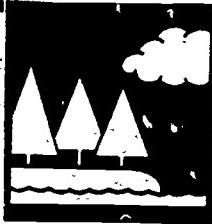
Control erosion

- a. plant trees and grasses
- b. place rip rap on river banks
- c. plant protective hedges

Develop measures that will maintain or enhance fish and wildlife habitat where development is planned

Competency: Protect water resources

- Tasks:**
- Explain how to build settling ponds
 - Explain how to install septic tanks
 - Explain how to avoid pathogenic contamination
 - Measure characteristics indicating water quality
 - Treat water
 - Explain sewage treatment in private dwellings
 - Explain sewage treatment in municipalities
 - Explain ways to conserve water resources in sewage treatment
 - Explain the necessity for water conservation
 - Explain water conservation in terms of projected community needs and supply
 - Identify steps to assure future water supply



Competency: Protect air resources

- Tasks:**
- Describe catalytic burners
 - Describe emission control devices
 - Describe electro-static precipitators

IV. Define the Resource.

Competency: Understand the nature and properties of soil and soil formation

- Tasks:**
- Characterize soil profile horizons
 - Identify components of soil including:
 - a. living organisms
 - b. mineral matter
 - c. organic matter
 - Classify soil water by how it is utilized including:
 - a. hygroscopic soil water
 - b. capillary soil water
 - c. gravitational soil water
 - Identify factors responsible for the formation of soils including:
 - a. parent material
 - b. climate
 - c. plants and animals
 - d. topography
 - e. time
 - Differentiate among:
 - a. igneous rocks
 - b. sedimentary rocks
 - c. metamorphic rocks

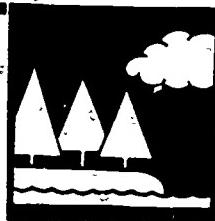
Competency: Understand components of air and their role

- Tasks:**
- Identify the chemical makeup of air
 - Explain the formation and importance of oxygen
 - Identify the role of the ozone layers of the atmosphere
 - Identify the role of wind in erosion

Competency: Understand components of water

- Tasks:**
- Identify the chemical components of water
 - Explain unique characteristics of water
 - Identify the role of water in erosion

V. Understand the Importance of the Resource.



Competency: Understand the importance of land resources

Tasks: Explain the importance of:

- a. wild spaces
- b. forest resources
- c. agriculture resources
- d. land for housing
- e. wildlife and fish habitat

Competency: Understand the importance of water resources

Tasks: Explain the importance of:

- a. clean drinking water
- b. water to cool power plants
- c. water for irrigation
- d. water for transportation
- e. wetlands and estuaries
- f. watersheds
- g. water for fish and wildlife

Competency: Understand the importance of air resources

Tasks: Explain the air requirements of living things

Explain the need for clean air

Explain protective features of the ozone layer

Identify the role of the atmosphere in the water cycle

VI. Understand competing uses.

Competency: Understand human-caused problems associated with land, air, and water

Tasks: Characterize types of human-created pollution including:

- | | |
|-------------------------|--|
| a. sewage | f. nuclear |
| b. industrial | g. air pollution |
| c. pesticides | h. noise |
| d. silt & sedimentation | i. organic debris (eg. logging wastes, fish processing wastes) |
| e. thermal | |

Competency: Understand the effects of air polluting particulates and gases

Tasks: Define types of pollution

Identify reasons pollution is often ignored instead of alleviated

Explain the detrimental health hazards associated with industrial pollution, including agriculture

Compare the amount of pollution produced by various types of fuel

Describe the chemical reaction that forms smog

Contrast smog and ice fog

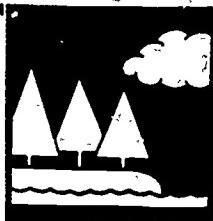
Locate areas prone to smog in the United States and Alaska

Identify effects of smog

Name and discuss sources of polluting particulates

Describe the role of wood stoves in air pollution

- Explain sources and effects of indoor air pollution
- Explain the effects of specific gases and particulates on human health, plant life, and the durability of materials
- Identify which pollutants are most harmful to human health, plant health, and the wear life of materials
- Identify federal standards which divide safe concentration levels from unsafe concentration levels of specific air pollutants



Competency: Understand acid rain concerns

- Tasks:**

 - Describe terms and principles associated with acid rain
 - Explain the water cycle
 - Describe the significance of acid rain
 - Explain factors that compound the problem of acid rain
 - Identify geographical areas most affected by acid rain
 - Explain implications on national and international policies

Competency: Understand effects of thermal pollution on lakes and streams

- Tasks:**

 - Identify terms and principles associated with thermal pollution
 - Explain why power plants produce waste
 - Identify ways that waste is dissipated in modern power plants and industrial processes

Competency: Identify effects of water-polluting substances

- Tasks:** Explain impacts of:

 - a. Logging debris deposition in streams
 - b. Siltation of streams, lakes, and lakes by road and pipeline construction, placer mining, etc.
 - c. Introduction of organics into streams and lakes
 - d. Introduction of toxic materials

Competency: Understand impacts of power generation

- Tasks:** Explain impacts of:

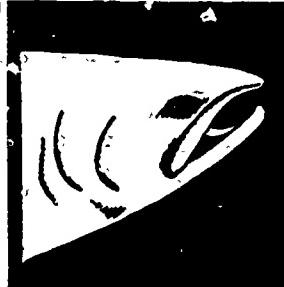
 - a. coal-generated power
 - b. nuclear-generated power
 - c. using wastes for power generation
 - d. using petroleum-based power generation

Explain impacts of alternative methods of power generation such as:

- a. wind generation (e.g. unsightly wind towers)
 - b. ocean power (e.g. closing off estuaries for tidal dams)
 - c. biomass power (e.g. wood smoke pollution)
 - d. hydro power (e.g. destruction of salmon streams)

Fishing and Fisheries

(A) Denotes more advanced competency or task.



I. Work with the Resource.

Competency: Identify employment and educational opportunities in fishing and fisheries

- Tasks:**
- Identify educational and occupational opportunities
 - Locate resources for finding employment
 - List prospective employers
 - Identify and implement SOEP, Coop, or QJT
 - Identify work in:
 - a. fisheries enhancement
 - b. hatcheries
 - c. commercial fishing
 - d. canneries
 - e. cold storages
 - d. equipment and facility maintenance
 - e. fish and game biology
 - f. fish and wildlife protection
 - g. sports fishing
 - h. fisheries laboratories

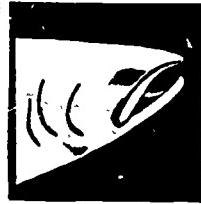
II. Use the Resource.

A. Safety

Competency: Practice personal safety and accident prevention

- Tasks:**
- Prepare for vessel emergencies
 - Explain emergency procedures for: fire, collisions, capsize, foundering, man-overboard and personal injuries:
 - a. alert crew
 - b. issue personal flotation and immersion protection devices
 - c. administer first aid to prevent shock and control bleeding
 - d. administer CPR
 - e. don survival suit
 - e. launch and operate lifeboat and life raft
 - f. close emergency fuel shutoff valves
 - g. extinguish Class "C" fire
 - h. act as lookout to keep person in sight who has been lost overboard
 - i. secure engine room to prevent spread of fire
 - j. send out distress signals
 - k. sound abandon-ship alarm
 - Use cold-water survival skills
 - Treat victims for hypothermia
 - Apply first aid
 - Explain preparation for helicopter rescue
 - Use life raft survival
 - Explain survival suit use
 - Identify shore survival techniques
 - Identify sources of water and food in a wilderness setting

Competency: Use boating safety and seamanship skills



Tasks: Explain the basic terms and principles of seamanship

Use basic knot techniques

Describe boating laws

Explain navigational aids and charts

Use nautical equipment including:

- | | |
|----------------|------------------|
| a. barometers | f. loran |
| b. CB | g. marine radios |
| c. compasses | h. radar |
| d. dividers | i. sextants |
| e. fathometers | j. sonar |

Use marine VHF, using proper procedures, etiquette, and channels

Obtain and explain a current weather forecast

Recognize changes in weather conditions

Recognize importance of US Coast Guard

(A) Complete a USCG license course

B. Seamanship.

Competency: Use a tide book, nautical chart, and coast pilot

Tasks: Determine tide for a given location

Explain how to determine tide from a known tide level

Use the "Rule of Twelve" to determine tide level at any point in tidal cycle

Identify symbols used on nautical charts

Plot and find directions and distances on a chart

Read current tables

Competency: Check out and get a vessel underway

Tasks: Develop and follow a check list for getting underway

Engage bilge and engine room blowers and bilge pumps

Maintain proper level of coolant in expansion tank

Determine if all navigation lights are functioning

Tighten engine mounts

Inspect fire-fighting equipment for wear, location, and type

Secure deck equipment, lashings, hausers, or mooring lines

Inspect personal flotation devices for number, fit, integrity, and location

Inspect survival suits for number, fit, integrity, location and type

Inspect vessel for fuel leakage

Prepare list of equipment to be checked for oil leakage

Secure watertight doors, hatches, vents, and skylights

Bleed air compressor of water

Check and maintain batteries

Determine fuel levels

Inspect water level indicators for cleanliness

Test radio equipment

Inspect antennas

Determine if hydraulic steering equipment is free of air and water

Determine that rudder stuffing box is functioning properly

Tighten propeller stuffing box

Determine if proper voltage is being generated

File a float plan

Competency: Maneuver a vessel



Tasks: Observe the "rules of the road"

Follow safe boating practices

Pilot using dead reckoning, time, distance, and speed

Use various forms of running fixes including:

- a. 45-90
- b. 22 1/2-45
- c. 26 1/2-45

Pilot using a cross bearing

Use navigational aids, tide and current charts and equipment

Maintain adequate safety margins regarding weather and sea conditions

Competency: Use the rules of the road

Tasks: Identify marine vessel boundaries

Identify terms and definitions related to marine charts and rules of the road

Use steering and sailing rules including:

- a. rules when approaching sailing vessels
- b. rules for vessels meeting, nearing a bend, leaving berth
- c. rules for passing a vessel head on
- d. rules for overtaking a vessel
- e. general prudential rule

Identify special situation lighting and signals

Plot a course on a chart and convert true bearings to compass bearings

Identify day markers and fog signals

Identify distress signals

Competency: Use modern electronic systems

Tasks: Use echosounders and depthfinders to:

- a. differentiate among types
- b. interpreting signals

Use Radio Direction Finders (RDF) to:

- a. identify range of equipment available.
- b. install loop antenna
- c. use RDF aboard small craft
- d. identify marine radio beacon stations and systems
- e. plot radio bearing and finding position with RDF

Use RADAR including:

- a. install, identify components of, and operate RADAR
- b. use RADAR as a navigational aid
- c. interpret RADAR signals
- d. pilot using RADAR
- e. monitor RADAR beacons (RACON)
- f. identify radiation hazards
- g. install and use RADAR reflectors

Use LORAN C or OMEGA including:

- a. explain hyperbolic navigation systems
- b. differentiate among groundwaves and skywaves
- c. characterize LORAN C and OMEGA receivers
- d. navigate with LORAN C

Use SONAR

- a. install, identify components of, and operate SONAR
- b. interpret SONAR signals
- c. navigate and find fish with SONAR



Competency: Use marine lights and sound signals

Tasks: Explain when marine lights are needed

Identify rules for the following situations:

- a. steam vessel underway
- b. steam vessel towing and pushing
- c. sailing vessel and vessels in tow
- d. small vessels
- e. pilot vessels
- f. fishing vessels
- g. stern lights
- h. anchor lights
- i. signals to attract attention

Sound signals for the following situations:

- a. steam vessels underway
- b. sailing vessels underway
- c. vessels at anchor
- d. vessels towing or being towed
- e. speed in fog

Competency: Get along with other members of crew

Tasks: Explain common causes of strife aboard vessels

Explain the importance of getting along with others while at sea

Utilize stress-reduction techniques

Utilize communications techniques

Practice communications techniques with others

Explain how to take a grievance to the captain

Competency: Anchor vessel

Tasks: Anchor vessel by using anchor winch or windlass

Secure anchor on bottom

Retrieve and secure anchor and stack (tier) anchor chain in locker

Competency: Dock a vessel

Tasks: Assign tasks and stations for vessel mooring

Maneuver to dock

Secure mooring lines to dock and/or other vessels

Secure engine room and secure propeller shaft

Release towing gear

C. Building, handling, and maintaining gear

Competency: Build, mend and repair nets and lines

Tasks: Define terms related to net and line construction and repair

Build, mend and repair lines including:

- a. corkline
- b. leadline
- c. weedline
- d. breamline

Melt, tape, or whip line ends to prevent unraveling

Mend nets by:

- a. using 1, 2, and 3-bar hole repair
- b. trimming problem area
- c. initiating starter knot
- d. using pick up sider and bar
- e. maintaining proper net length with repair



Patch nets by:

- a. trimming problem area
- b. splitting edges
- c. squaring repair patch
- d. lacing twine

Complete complicated net and line repairs

Competency: Operate and maintain gear hydraulics

Tasks: Define basic principles of hydraulics

Diagram vessel hydraulic systems

Use proper hand signals while operating hydraulic equipment

Competency: Maintain and operate processing equipment

Tasks: Explain the maintenance and operating procedures for:

- a. freezing equipment
- b. canning equipment
- c. ice-making equipment
- d. auxiliary power generating equip.
- e. seafood clearing equipment
- f. conveyor and product handling equip.
- g. chilling and cooling equipment
- h. testing and quality control equipment

D. Vessel operation and maintenance.

Competency: Conduct deckhand duties

Tasks: Wear proper clothing for duties

Hand or hoist equipment and supplies aboard

Cast vessel off

Coil lines

Work riggings such as nets, slings, hooks, cables, booms, and hoists

Stand look-out, steering, and engine room watches

Operate dories, dinghies, and skiffs

Attach accessories, such as floats, weights, and markers to nets and lines

Pull and guide nets and lines onto vessel

Wash deck, conveyors, knives, and other equipment, using brush, detergent, and water

Lubricate, adjust, and maintain engines and equipment

Competency: Maintain vessel's

Tasks: Arrange for grid, dry docking, or haul-out

Change brushes in auxiliary engines

Change lube oil and fuel filters on auxiliary engines

Determine if motor bearings are excessively worn

Clean electric motor

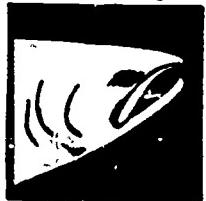
Prepare list of hoses, valves, connections, gaskets, and tanks needing repairs

Determine if const-a-voltage regulator is functioning properly

Determine if drive belts on air compressors are excessively loose

Tighten panel box fittings to prevent vibration

Clean keel cool strainers, oil coolers and oil strainers in marine gears



- Drain water out of fuel traps
- Tighten fuel and oil line connections on engines
- Inspect day tanks containing fuel for leaks
- Lubricate deck and engine room equipment
- Determine vessel's manning requirements
- Splice eye into line
- Wash down vessel's superstructure and decks
- Inspect and maintain hull, keel, and rudder assembly

Competency: Prevent marine corrosion problems

Tasks:

- Explain how electrolysis causes marine corrosion
- Design appropriate bonding systems for vessel components
- Wash, brush, and paint problem areas

E. Other duties and skills.

Competency: Prepare meals aboard the vessel

Tasks:

- Plan menus
- Order supplies
- Store food properly
- Prepare a balanced meal
- Clean galley deck, woodwork, cabinets, dishes, glasses, flatware, trays, pots and pans
- Practice safety with oil stoves
- Use a microwave
- Use a fire extinguisher

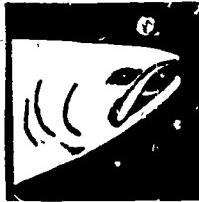
Competency: Maintain and analyze records related to fishing

Tasks:

- Maintain trip record
- Maintain ship's log
- Maintain business ledger
- Record catch
- Record income
- Record fish sales records
- Keep expense records
- Use checking account
- Reconcile bank statement
- Inventory assets
- Analyze profits and losses including:
 - a. variable and fixed costs
 - b. opportunity cost
 - c. return to labor, management investment
- Determine net worth
- Apply skills to SOEP, Coop, or OJT

(A) Competency: Secure loans from bank and state agencies

Explain the procedure for obtaining a limited entry permit
Keep records related to loan



(A) Competency: Compute the tax liabilities of a fisherman

- Tasks:**
- Calculate estimated tax payments
 - Calculate depreciation of vessel and other equipment
 - Calculate investment credit
 - Calculate sale and exchange of assets
 - Calculate deduction and substantiation

F. On-board fish handling.

Competency: Understand the importance of fish quality

- Tasks:**
- Explain the importance of maintaining on-board fish quality
 - Maintain fish quality

Competency: Handle fish correctly aboard the vessel

- Tasks:**
- Explain the importance of good handling practices
 - Relate catching rates to correct fish handling
 - Correctly bleed and gut fish
 - Wash fish
 - Store fish on the vessel
 - Unload fish from vessel

Competency: Practice vessel sanitation

- Tasks:**
- Explain the importance of vessel and product sanitation
 - Use sanitation tools
 - Use chemical sanitizers
 - Identify potential sanitation problems

Competency: Store fish aboard the fishing vessel

- Tasks:**
- Explain the importance of chilling seafood
 - Store fish without refrigeration
 - Ice fish
 - Store fish with chilled sea water
 - Store fish with refrigerated sea water
 - Freeze fish at sea

G. Marine products processing.



Competency: Process fish

Tasks: Describe both shore-based and floating processing operations
Use processing procedures including:

- a. assembly-line processing
- b. beheading
- c. gutting
- d. skinning
- e. scaling
- f. cleaning
- g. icing
- h. chilling and cooling
- i. crating
- j. canning
- k. cooking
- l. drying
- m. smoking
- n. foil wrapping
- o. freezing
- p. maintaining quality control
- w. shipping live

Explain steps involved in roe processing

Competency: Handle and process marine products

Tasks: Store fish products using icing and refrigeration

Clean seafood

Use quality control in processing

Keep seafood cool, clean, moist and moving

Pack fish eggs for shipping

(A) Trace marine products from the ocean to the retailer

(A) Explain economics of seafood processing

(A) Explain marketing considerations involved in proper seafood handling

Competency: Maintain fish quality during storage and shipping

Tasks: Explain the importance of chilling seafood

Define fish processing and refrigeration terms

Identify fish processing sanitation principles and procedures

Determine how long various marine products can be preserved by refrigeration

Identify potential chemical, biological and bacteriological problems in the fishing industry

- a. conduct bacteria tests
- b. identify problems by sight and smell
- c. dispose of contaminated marine products
- d. recognize how to anticipate and prevent sanitation problems before they occur

Explain upper and lower refrigeration temperature limits for the various marine products

- a. recognize potential sanitation problems
- b. explain disinfecting procedures
- c. plan stock rotation to insure freshness
- d. control temperature during processing

Control/modify atmosphere storage of product

Freeze product

Ship processed product

Competency: Sanitize seafood plant

- Tasks:**
- Explain the importance of cleaning and sanitizing seafood plant
 - Use cleaning equipment
 - Use chemical sanitizers
 - Control pests
 - Maintain personal health and hygiene



H. Actively fish.

Competency: Net fish

- Tasks:**
- Explain principles and techniques associated with various net fisheries
 - Locate quarry using equipment available
 - Operate and maintain net fishing equipment such as dip, diver, gill, hoop, lampara, pound, trap, reef, trammel, and travel nets
 - Operate and maintain seine equipment such as purse seine, haul, drag, or beach seine and power skiffs
 - Insert and attach hoops, rods, poles, ropes, floats, weights, beam runners, other boards, and cables to form, reinforce, position, set, tow, and anchor net as required
 - Tow net to location and anchor in place
 - Attach appropriate flags and lights to buoys to mark and identify nets
 - Haul net with appropriate gear
 - Remove catch using appropriate techniques and equipment such as dip net, brail buckets, hydraulic pumps, conveyor, lifting net, blocks, tackles, and dumping catches
 - Clean, store and transfer catch appropriately
 - Sort and clean fish, throwing undesirable and illegal catch overboard
 - Stow catch in hold or transfer to tender
 - Repair fishing nets and gear
 - Complete minor repairs of engines and equipment
 - Wash deck and equipment

Competency: Line fish

- Tasks:**
- Define line fishing terms
 - Explain principles and techniques associated with various line fisheries
 - Lay out gear
 - Attach:
 - a. hooks
 - b. bait
 - c. sinkers
 - d. anchors
 - e. floats
 - Anchor bottom line for bottom fishery
 - Cast line into water and hold, anchor, or troll for troll fishery
 - Retrieve gear onto boat deck by hand, reel, or winch
 - Haul line by hand or reel and winch onto deck
 - Unload fish from boat
 - Clean, pack and store catch appropriately
 - Slit fish, remove viscera, wash cavity and prepare for storage
 - Wash deck and equipment using brush, detergent and water
 - Lubricate and make minor repairs to engines and equipment

Competency: Pot and trawl fish



- Tasks:**
- Define pot fishing terms
 - Explain pot fishing techniques
 - Rig boat and deploy gear such as pots, floats and markers
 - Tie marker float to line, attach line to pot, fasten bait inside pot, and lower pot into water
 - Retrieve gear and remove catch
 - Hook marker float with pole and haul up pot
 - Remove catch or clump catch on dock
 - Measure catch with fixed gauge
 - Place legal catch in container and return illegal catch to sea
 - If applicable, rig and lower dredge (rake scoop with bag net attached), drag dredge behind boat to gather marine life from water bottom, and hoist it to deck by hand using block and tackle
 - Store catch aboard vessel

(A) Competency: Plan and implement mariculture venture, SOEP, Coop, or OJT

- Tasks:**
- Gain capital securities
 - Obtain required permits and necessary statements
 - Complete business plan including:
 - a. five-year cash flow plan
 - b. production system
 - c. construction and operating costs
 - d. expected problems and solution
 - e. projected market supply and demand
 - f. projection of overall stability and flexibility

(A) Competency: Analyze economic factors related to a mariculture venture

- Tasks:**
- Analyze economic factors including:
 - a. tenure of site
 - b. initial capital investment for constructing and operating
 - c. environmental conditions which will affect production cost
 - d. level of security needed
 - e. transportation means and distance to marketplace
 - f. local competitors
 - g. type and cost of personnel

(A) Competency: Select species for mariculture venture

- Tasks:**
- Analyze viability of species including:
 - a. sources and availability of stocking species
 - b. stocking density and rates
 - c. feeding requirement and sources, availability, cost, quality, quantity, etc.
 - d. growth rates
 - e. behavioral response to environmental stress, handling, and transporting
 - f. vulnerability to disease and predators, and response to treatment
 - g. behavior patterns which will influence management strategies
 - h. harvesting strategies and frequencies



Analyze marketability of selected species including:

- a. demand throughout the year and its stability
- b. supply throughout the year and degree of saturation
- c. wholesale and retail prices
- d. consumer's preferences
- e. similar and substitute products
- f. expenses and cost
- g. gross and net profits
- h. rate of return

(A) Competency: Locate feasible mariculture site

Tasks: Analyze environmental resources including:

- a. sea conditions
- b. bottom conditions
- c. topography of site and surrounding areas
- d. climatic conditions
- e. other uses of site
- f. accessibility throughout the year
- g. activities of surrounding area
- h. other marine resources present and impacts of mariculture development

(A) Competency: Construct and maintain mariculture site

Tasks: Examine area

Sketch out design, taking into account:

- a. biological needs of the cultured species
- b. ecological needs of the cultured species
- c. utilizing topography and environment so as to minimize operating costs
- d. keeping harvesting methods efficient
- e. keeping construction costs minimal

Remove obstacles which may interfere with operations

Select appropriate type and size of cage to:

- a. meet the biological need of the cultured species
- b. withstand the elements
- c. endure pressure of water current and when transporting
- d. screen out predators

Examine unit cost per cage in relation to operating, harvesting, yields, and net profit

Design cage lay-out system considering:

- a. position of cages in water column
- b. water quality and circulation
- c. predators
- d. disease
- e. ease of cultivation
- f. ease of transportation
- g. unexpected problems
- h. security

Construct cages to endure interaction with environment

Install and secure cages

Maintain cages

(A) Competency: Stock and maintain species in cages

Tasks: Calculate proper stock density considering:

- a. natural productivity
- b. the need for supplemental feeding and/or fertilizer
- c. the size of the cages
- d. biological characteristics of the target species
- e. economic (profitability) factors

Check that stocking material are healthy



Acclimate stocking material to sea water and sea water temperature and release

Determine available natural food source by analyzing:

- a. quality of food present
- b. quantity of food present
- c. environmental influences including temperature, sunlight, and water chemical characteristics
- d. characteristics of the cage

Clean cages of undesirable sea life

Select feeds to meet nutritional requirements of target species

Determine feeding rates and amount

Mix, mince, dry, and/or cook foods as needed

Store foods

Apply feeds manually, mechanically, and/or automatically

(A) Competency: Harvest mariculture fish and/or material

Tasks: Net, trap and/or lift material from cages

Process fish and/or material, including:

- a. sorting and grading
- b. chilling or putting fresh material in tanks
- c. freezing whole, tails only, or fillets, depending on market

Transport fish and/or material to market

(A) Competency: Increase production as feasible

Tasks: Increase production by:

- a. expanding numbers of cages
- b. manipulating stocking frequency and rates
- c. sorting population size and/or ages, then segregating into different ponds
- d. using supplemental feeding techniques and formulas
- e. altering harvesting techniques

III. Manage and Protect the Resource.

Competency: Understand the important state and federal regulations and regulatory agencies pertaining to fisheries

Tasks: Identify the role of:

- a. State Board of Fisheries
- b. fishery advisory committees
- c. International Halibut Commission
- d. Alaska Department of Fish and Game
- e. Alaska Division of Fish and Wildlife Protection
- f. U.S. Coast Guard

Identify rules pertaining to catch and size for local fishery - include throwing illegal catch overboard

Competency: Understand the important state and federal regulations and regulatory agencies pertaining to navigation

Tasks: Identify different classes of vessels including:

- a. Class A
- b. Class 1
- c. Class 2
- d. Class 3

Register vessel and display number on boat

Explain how vessels and/or captains may take passengers for hire

Explain enforcement of rules of navigation

Identify the role of the U.S. Coast Guard

Explain rules pertaining to distressed vessels



Competency: Understand fish management practices

Tasks: Assess fish stock

Explain concepts of sustained yield fishery

Explain concepts of limited entry fisheries

Identify the consequences of fishery over-exploitation

Explain the future of local and statewide fisheries

Trap and strip fish

Maintain rear ponds

Stock lakes and streams

Rehabilitate waters

Explain how to rescue fish

Survey fish

Remove rough fish

Improve spawn areas

Explain enforcement of proper fishing harvest laws and fish habitat protection laws

(A) Competency: Define important factors for hatchery placement

Tasks: Contrast early salmon hatcheries with contemporary ones

Explain the need for salmon hatcheries

Explain a hatchery's need for a steady water supply

Explain environmental factors of salmon hatchery placement

Explain the importance of proximity to good fish habitat

Competency: Define important hatchery techniques

Tasks: Explain salmon hatchery spawning

Explain salmon hatchery incubation

Explain the feeding of salmon fry

Explain the issue of fish disease in hatcheries

Explain how hatchery smolt are released

Competency: Work in a hatchery

Tasks: Complete paperwork related to hatchery

Construct and maintain incubation system

Collect adults to serve as brood stock

Transport milt and eggs

Fertilize eggs

Monitor eggs during incubation



Identify various developmental stages
Remove dead fish and eggs
Determine survival rates at various stages of development
Maintain environmental factors promoting the development and survival of eggs, fry, and adults
Collect and analyze samples from incubation water
Mark released fry
Monitor return runs to establish survival rates
Collect, record, and analyze data obtained

Competency: Care for fish in a hatchery

Tasks: Explain salmon development from unfertilized egg to adult salmon
Define anadromous
Identify salmon hatchery procedures
Identify internal and external characteristics of salmon anatomy
Identify environmental factors affecting salmon survival
Identify natural events and cycles affecting salmon survival

Competency: Manage salmon

Tasks: Identify agencies involved in management of Alaska's salmon
Explain different methods for assessing the fishery
Identify the goals of salmon management

IV. Define the Resource.

Competency: Understand Alaska's water resources

Tasks: Explain the origins of the oceans
Examine the geology of Alaska's sea bottom
Point out major tidal areas in Alaska
Explain possible effects of water pollution on Alaska's water resources
Point out locations of major Alaskan fisheries
Identify major Alaskan seaports
Identify major Alaskan watersheds

Competency: Identify attributes of Alaska's commercial fish species

Tasks: Understand attributes of salmonids including:

- external anatomy
- internal anatomy
- classification
- distinguishing characteristics
- life histories including:
 - embryology
 - life history stages

Identify attributes of bottomfish including:

- anatomy
- classification
- distinguishing characteristics
- life history including:
 - embryology
 - life history stages

Identify attributes of dungeness, tanner, and king crabs including:

- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
 1. embryology
 2. life history stages



Identify attributes of shrimp including:

- a. anatomy
- b. classification
- c. distinguishing characteristics
- d. life history including:
 1. embryology
 2. life history

Identify the natural foods of fish including:

- a. aquatic insects
- b. plankton

Age fish by:

- a. scales
- b. otoliths
- c. bones
- d. back calculations (growth)

Use plankton net in studying microscopic water life

Use hand dredge for examination of bottom samples

Use seines for identification of small forage fish

Identify Alaska's under-utilized marine resources

Competency: Understand the life cycles of Pacific salmon

Tasks: Explain the:

- a. hatching process of salmon
- b. life processes of salmon fry
- c. life processes of adult salmon
- d. reproductive phase of salmon
- e. importance of dead salmon to stream replenishment
- f. issue of man-made hindrances to salmon reproduction

V. Understand the Importance of the Resource.

Competency: Understand the economic importance of fishing to Alaska

Tasks: Understand the importance of marketing fisheries resources to the viability of Alaska's fishing industry

Identify the relative dollar value of the Alaskan fishing industry

Locate important Alaskan fishing ports on a map

Identify potential expansion in the fishing industry including:

- a. salmon farms
- b. oyster farms
- c. other shellfish and finfish mariculture developments
- d. bottom fishery

Explain the importance of seafood in the life and economy of Alaska

Contrast life histories of the major commercial fishery species of Alaska

Contrast methods, vessels and gear involved in the Alaskan commercial fisheries

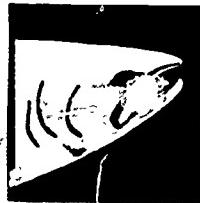
Explain how fisheries managers attempt to regulate the fisheries to the mutual benefit of the resource and the fisherman

Compare and contrast the following fisheries:

- a. salmon
- b. halibut
- c. herring
- d. king crab and tanner crab
- e. bottom fish
- f. shrimp and other invertebrates
- g. shellfish

Identify different species within each fishery.

Identify gear and vessels used for each fishery.



Competency: Understand the traditional importance of fishing to Alaska

Tasks: Trace the history of the marine harvest in Alaska including:

- a. historic Native harvest
- b. Russian fur trade
- c. turn of the century canneries

Relate the importance of fishing to Native Alaskan cultures

Contrast the Native salmon fishery past and present with the non-Native salmon fishery

Project future trends in Alaska's fisheries

Competency: Understand the international importance of fishing to Alaska

Tasks: Identify foreign fishing fleets which frequent Alaskan waters

Identify international rules and regulations which pertain to fishing in Alaskan waters

Identify boundaries of U.S. fishing regulations

VI. Understand Competing Uses.

Competency: Understand the role of fisheries management

Tasks: Explain the importance of fisheries management

Identify general management policies related to fish species including:

- a. sport fish
- b. rough fish
- c. forage fish

Identify general management policies related to fish habitat management

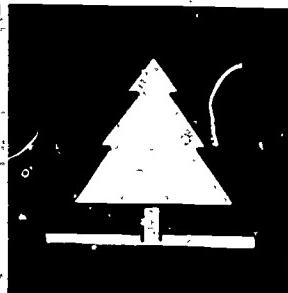
Competency: Understand forces competing for Alaska's fishery resources

Tasks: Identify state, national, and international groups competing for Alaska's fishery resources

Explain the introduction of shellfish and finfish mariculture on traditional fisheries

Forestry, Production and Processing

(A) Denotes more advanced competency or task.



I. Work with the Resource.

Competency: Understand employment and educational opportunities in forestry management, production, and processing

- Tasks:**
- Describe the scope of the forest industry
 - Identify educational and occupational opportunities
 - Locate resources for finding employment
 - Confer with prospective employers
 - Identify work in:
 - a. timber stand improvement
 - b. nurseries
 - c. commercial logging
 - d. saw mills
 - e. lumber yards
 - d. equipment and facility maintenance
 - e. forest management
 - f. forest protection
 - g. forest planning
 - h. forestry research
 - Identify relative numbers of jobs available in above areas
 - Identify organizations which employ persons trained in forestry
 - Identify employment policies related to employment in forestry
 - Plan and implement an SOEP, Coop or OJT

II. Use the Resource.

Competency: Understand timber management techniques

- Tasks:**
- Identify logging terms, principles and techniques
 - Describe state and federal logging laws
 - Develop a logging plan taking into account:
 - a. forest resources
 - b. soil conservation
 - c. forest conservation
 - d. wood level planning
 - e. fish and wildlife habitat protection

Competency: Understand timber harvesting techniques (basics of silviculture)

- Tasks:**
- Describe the methods, purposes and advantages/disadvantages of several harvest practices, taking into account even and uneven aged forests, including:
 - a. clearcutting
 - b. seed-tree cutting
 - c. shelterwood cutting
 - d. selection cutting
 - Identify different logging systems including:
 - a. aerial
 - b. highlead
 - c. skyline
 - d. ground
 - e. tractor
 - f. rubber tired

Competency: Complete a rough land survey

Tasks:

- Explain basic surveying terminology and principles
- Use a hand compass and staff compass to run a property line
- Obtain legal land descriptions
- Read legal descriptions
- Read legal plats
- Make slope corrections
- Read aerial photos with stereoscope
- Determine pace factor
- Run directional line



Competency: Measure a stand (cruise timber)

Tasks:

- Explain timber cruising terms and principles
- Map tree types of given area
- Pace and measure given plots
- Determine the height of trees using a clinometer, Abney level, Relescope, and hypsometer
- Determine the diameter of trees using a diameter tape or Biltmore stick
- Determine the number of 16-foot saw logs in given trees using a cruiser's stick
- Identify defects in trees
- Install cruise plots and determine volume of stand
- Use tree volume table
- Calculate gross and net volumes

Competency: Scale logs

Tasks:

- Explain timber scaling terms and principles
- Name tools and equipment needed for proper scaling
- Use and contrast International 1/4-Inch and Scribner Log Rules
- Use a log rule to determine the board measure of different sized logs
- Use a scale stick to determine log volume
- Determine defect deductions
- Use log volume tables
- Record log volumes

Competency: Survey roads

Tasks:

Use:

- a. rod
- b. tape
- c. transit

- Take surveying notes
- Place and read stakes
- Complete a differential level
- Work safely around heavy equipment
- Read road profiles

Competency: Use an axe

Tasks:

- Describe the proper use and care of an axe including use of file and bench grinder
- Demonstrate the proper safety precautions for using an axe
- Split wood with the axe
- Buck log with axe

Competency: Use a chain saw



Tasks:

- Describe and name the various parts of a chain saw.
- Describe relevant fire regulations in relation to chain saw use
- Demonstrate proper safety procedures in operating and handling a chain saw

Service chain saw

Use the proper procedures for operating a chain saw in the forest including:

- a. operate the saw safely
- b. mix fuel
- c. oil the chain
- d. adjust chain tension
- e. sharpen chain
- f. maintain oil level
- g. clean air filter
- h. limb timber
- i. fell timber
- j. prepare the chain saw for storage

Use bench grinder and chain sharpener including:

- a. adjust rests
- b. wear safety goggles
- c. test and replace grinding wheels
- d. dress the wheel

III. Manage and Protect the Resource.

Competency: Improve stands

Tasks:

- Describe several goals of stand improvement
- Identify undesirable types of trees to be removed for stand improvement including:
 - a. wolf or spreading trees
 - b. crooked trees
 - c. trees with forked trunks
 - d. over-mature trees
 - e. dead, damaged, or diseased trees
- Identify impacts of stand improvement on fish and wildlife habitat
- Read and interpret a stand table for stand improvement data
- Describe the difference between a pure stand and a mixed stand
- Describe the differences between an even aged stand and an uneven-aged stand
- List several reasons or purposes for thinning a forest
- Recommend a specific thinning technique for a specific stand
- Fertilize tree stand
- Thin tree stand
- Prune tree stand

Competency: Control undesirable brush and weeds

Tasks:

- Identify available herbicides and their functions
- Identify methods of application of herbicides
- Control burn

Competency: Reforest

Tasks: Reforest through natural means including:

- a. recognize seed crop
- b. prepare the site (excluding scarification)

Reforest through artificial means, including:

- a. define tree planting terms, tools, principles and methods
- b. prepare site for tree planting
- c. dry, remove seeds, and de-wing seeds
- d. store seeds
- e. test seed germination
- f. identify seed collection
- g. determine the time for planting tree seedlings
- h. plant tree in nursery bed
- i. handle and transport seedlings
- j. collect ripe seed cones

Hand plant seedlings by use of:

- a. mattock
- b. planting bar
- c. planting machine



Competency: Manage Insects

Tasks: Describe the major ways in which insects damage trees including:

- a. defoliating insects
- b. girdling insects

Identify insects which have been destructive to trees in Alaska including:

- a. spearmark black moth
- b. spruce budworm
- c. hemlock sawfly
- d. ips
- e. bark beetles

Recognize insect damage to trees

Identify situations particularly inviting to certain pests

Directly and indirectly control forestry insect damage

Use pesticides safely (if appropriate)

Competency: Control forest diseases

Tasks: Define terms related to trees and tree diseases including:

- a. bark
- b. blight
- c. blister
- d. defoliating
- e. growth rate
- f. parasite
- g. pest
- h. rot
- i. rust
- j. wilt
- k. wood fiber

Describe different ways in which diseases damage trees:

- a. kill or deform
- b. decrease growth rate
- c. destroy heartwood

Identify common disease types

Identify tree damage caused by disease

Control forest diseases

Use pesticides safely

Identify cases where tree disease may actually be beneficial to tree stands or commercial harvest of tree stands or may benefit other forest resources such as wildlife

Identify cases where tree disease may be extremely harmful to tree stands or commercial harvest of tree stands

Competency: Understand the principles of fire ecology

Tasks:

- Identify plant communities damaged or benefited from fire
- Identify the effect of fire on wildlife habitat
- List the post-fire successive stages of major plant groups in Alaska
- Identify the effects of fire on plant succession
- Explain controlled burns



Competency: Understand basic tenets of wildland fire control

Tasks:

- Define the terms associated with forest fires, such as wildfires and controlled burns
- Explain the principles associated with fire ecology
- Explain important fire prevention and control techniques
- Explain controlled burning techniques
- Explain how to construct fire lines
- Explain safe fire-fighting practices
- Identify and be able to locate/contact agencies responsible for fire control in Alaska

Competency: Understand fire behavior

Tasks:

- Explain terms and principles integral to fire behavior including:
 - a. fire triangle
 - b. ignition temperature
 - c. heat sources for ignition
 - d. weather factors in fire behavior
 - e. principles of heat transfer
 - f. forest fuels and their effect on fire behavior
 - g. effects of topography on fire behavior
 - h. fire-caused environment
 - i. temperature and moisture
 - j. air masses and fronts
 - k. general circulation and local winds
- Explain how clouds serve as indicators of weather changes
- Predict winds
- Explain the role of basic weather forecasting in understanding fire behavior
- Use a weather field kit
- Calculate rate of fire spread based on fire behavior knowledge including:
 - a. use of computer in figuring fire spread
 - b. prediction of extreme fire behavior conditions
 - c. preparation of suppression plans based on weather forecasts

Competency: Use the pulaski, fire rakes, and fire shovels

Tasks:

- Wear proper clothing and other safety equipment when using the pulaski, rakes, and shovels
- Balance, swing, and use the pulaski
- Use rakes and shovels
- Use a file to sharpen pulaski, rakes, and shovels
- Replace broken pulaski, rakes, and shovel handles



Competency: Set up pumps

Tasks:

- Use positive displacement pumps
- Use centrifugal pumps
- Set nozzle pressure

Competency: Lay hose

Tasks:

- Identify fittings and explain their function
- Contrast advantages and disadvantages of several hose materials
- Explain friction loss in fire hoses
- Explain pressure loss through elevation
- Explain how pumps in series can increase pressure
- Explain how pumps in tandem can increase volume
- Determine hose lay
- Determine the quantity of hose needed for particular fires

Competency: Control fires

Tasks:

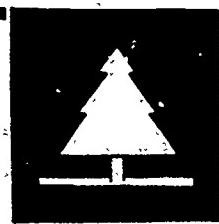
- Use the Planar Intercept method in determining amount of dead fuel
- Identify types of forest fires including:
 - a. crown
 - b. surface
 - c. ground
- Trace major causes of fires
- Trace a history of forest fires in Alaska
- Explain the use of fire plan maps
- Explain the use of a forester burning index meter
- Explain the necessity of burning permits
- Describe the place of prescribed burning in game management
- Explain the issues associated with wildfires in wilderness areas
- Describe international (Canadian) agreements/understandings regarding fires on international borders
- Identify the principles of sizing up a wildland fire
- Determine the capability of firefighting forces
- Select firefighting forces
- Locate control lines
- Use firefighting tactics
- Identify basic organizational requirements for wildland fires
- Process fire orders, fire reports, and records
- Effectively communicate at the fire

Competency: Control other dangers to forests

Tasks:

- Explain unwise human forest harvest methods
- Identify damages of unwise livestock grazing in forests
- Identify damage from over-browsing from wildlife
- Identify wind damage to trees
- Identify frost and snow damage to trees
- Identify animal damage to trees occurring from:
 - a. porcupines
 - b. deer
 - c. moose and caribou

IV. Define the Resource.



Competency: Understand major principles of botany

- Tasks:**
- a. Identify principles of plant growth
 - b. Name parts of plant cells and explain their function
 - c. Explain the reproductive processes of plants
 - d. Trace the process of photosynthesis
 - e. Identify major classifications of the plant kingdom

Competency: Understand main principles of forest ecology

- Tasks:**
- a. Trace stages of forest plant succession including:
 - a. pioneer weed stage
 - b. shrub stage
 - c. sub-climax or transitional forest stage
 - d. climax forest tree stage
 - e. post-climax stage
 - b. Compare and contrast the role of natural agents of succession (i.e., wildfire, floods) vs. manmade processes such as logging
 - c. Explain the role of plant quadrant studies, especially in measuring:
 - a. density of species
 - b. dominance of species
 - c. abundance of species
 - d. relative importance of species
 - d. Explain the process of forest microsuccession
 - e. Explain the role of diversity in the forest ecosystem

Competency: Understand types of soils and uses

- Tasks:**
- a. Explain how soil use affects human cultures
 - b. Explain basic physical properties of soils
 - c. Explain basic chemical properties of soils
 - d. Explain the importance of the moisture content of soils
 - e. Explain peat, how it is created, and its potential uses
 - f. Contrast soil erosion and soil depletion
 - g. Explain the importance of soil conservation in forestry management
 - h. Explain how various types of soils are identified

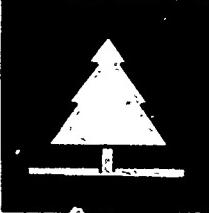
Competency: List parts of trees and shrubs

- Tasks:**
- a. Identify basic taxonomy of trees
 - b. Use a key to identify tree species by:
 - a. leaf
 - b. bark
 - c. twig
 - c. Make a tree key
 - d. Make a key of associated plant species

Competency: Understand stages of commercial stand development

- Tasks:**
- a. Trace stages of commercial stand development including:
 - a. forb-grass
 - b. shrub
 - c. seedling
 - d. sapling
 - e. pole
 - f. saw timber

Competency: Understand major commercial hardwood and softwood species



Tasks: Define the terms and principles associated with growth of hardwood and softwood species

Explain Alaskan tree species and their current and potential commercial value

Identify major hardwoods and softwoods by sawn woods

Competency: List types and geographic area of trees (and identify economic potential) for different parts of Alaska

Tasks: Identify local trees

Trace location of different types of trees in Alaska

Explain the potential for harvesting of different types of trees in different locations in Alaska

Identify the estimated board feet of harvestable timber in various parts of Alaska

Competency: List forest users and management services

Tasks: List major logging companies in Alaska

Identify government and other agencies including:

- | | |
|----------------------------------|--|
| a. AK Loggers Association | h. SE AK Cons. Council (SEACC) |
| b. AK Women in Timber | i. State of AK Dept. of Nat. Res. & |
| c. Bureau of Land Management | j. State of AK Div. of Forestry |
| d. Bureau of Outdoor Recreation | k. State of AK Div. of Pks and Otdr Rec. |
| e. National Park Service | l. U.S. Forest Service |
| f. Sierra Club | m. Wilderness Society |
| g. Society of American Foresters | n. AK Dept. of Fish & Game |

V. Understand the Importance of the Resource.

Competency: Understand the role of forest products

Tasks: List various forest products including:

- | | | | |
|--------------------------|---------|------------|----------|
| a. water (watershed) | | | |
| b. aesthetic attributes | | | |
| c. food | | | |
| 1. syrup | 2. nuts | 3. berries | 4. other |
| d. fiber (wood products) | | | |
| e. wildlife support area | | | |

Explain the relative value to Alaska of the following forestry products:

- | | |
|---------------|---------------|
| a. paper | d. firewood |
| b. lumber | e. house logs |
| c. chip board | |

Explain the feasibility of initiating a business with forestry products such as:

- | | |
|---------------------|--------------------|
| a. firewood | d. furniture |
| b. house logs | e. Christmas trees |
| c. rough-cut boards | |

Competency: Understand various roles of forestry

- Tasks:**
- Explain a history of outside forestry methods which influenced U.S. forestry
 - Explain the role of forestry in U.S. history
 - Explain the role of forestry in Alaskan history
 - Explain the value of forestry in Pacific Rim markets
 - Explain the importance of marketing forestry products in order to sell them



VI. Understand competing uses.

Competency: Understand competing uses of Alaskan forests

- Tasks:**
- Explain forestry use concepts such as:
- a. multiple use
 - b. sustained yield
 - c. productivity (biological vs economic)
- Explain the relationship of forestry watershed management to Alaska's fisheries
- Explain recreation versus economic uses of Alaska's forests
- Explain wilderness versus development uses of Alaska's forests
- Explain mining versus conservation uses of Alaska's forests
(national and state)
- Explain wildlife versus economic values of Alaska's forests in
relation to different successional stages of the forest
- Explain scientific baseline versus economic values of Alaska's forests
- Identify the impacts of forestry management practices on other
forest resources

Outdoor Recreation

(A) Denotes more advanced competency or task.



I. Work with the Resource.

Competency: Understand employment and educational opportunities in parks and outdoor recreation

Tasks:

- Identify requirements for jobs in parks and outdoor recreation
- Identify educational and occupational opportunities
- Locate resources for finding employment
- Confer with prospective employers
- Identify the work of:
 - a. backpacking guide
 - b. bus driver in or near parks and recreation areas
 - c. bus mechanic for buses in or near parks and recreation areas
 - d. bus tour maintenance worker
 - e. charter boat operator
 - f. clerk in parks and recreation visitor shops
 - g. clerk selling camping and hiking equipment
 - h. hotel worker in or near parks and recreation areas
 - i. mountain climbing guide
 - j. naturalist
 - k. outfitter
 - l. outfitter assistant
 - m. park aide
 - n. park maintenance worker
 - o. park ranger
 - p. park technician
 - q. recreation aid
 - r. restaurant worker in or near parks and recreation areas
 - s. ski lift operator
 - t. ski patrol person
 - u. tour bus driver
 - v. tourist guide for Alaska State Parks
 - w. tourist guide for city and local parks
 - x. tourist guide for private tour companies
 - y. tourist guide for state and federal historic sites
 - z. tourist guide for the National Park Service
 - aa. tourist guide in parks and recreation areas

Plan and implement SOEP, Coop or OJT

II. Use the Resource.

A. Work with People.

Competency: Manage visitor services

Tasks:

- Greet the visitor
- Inform visitors of regulations



- Register visitors
- Schedule events and programs
- Schedule facilities use
- Give instructions and directions
- Manage the flow of vehicular or pedestrian traffic
- Manage visitor requests and complaints
- Manage youth groups and events
- Take reservations
- Develop and conduct a visitors program and tour
- Prepare and give a naturalist slide show

Competency: Speak a second language

Tasks:

- Use greetings in local Native language
- Greet tourists in Japanese, French, and German
- Identify cultural differences among parks and recreation area visitors.
- Consider cultural differences in providing visitor services

B. Use Outdoor Recreation Equipment.

Competency: Operate and maintain equipment and tools

Tasks:

- Identify and use hand tools properly and safely
- Demonstrate basic mechanical skills useful in a recreational setting
- Operate and maintain tractors, machinery and equipment
- Maintain records of use, maintenance, and repair on machinery and equipment
- Prepare machines and equipment for storage
- Develop a project plan using sketches, scale drawings, bill of materials and cost estimation
- Safely construct a woodworking project using basic woodworking skills
- Prepare and paint metal, wood and masonry surfaces
- Identify, select and use common kinds of hardware
- Demonstrate basic electrical repair skills
- Demonstrate basic plumbing skills

Competency: Take photographs and/or assist visitors in doing so

Tasks:

Describe the major types of cameras and purposes of each

Identify basic parts of the camera and their function including:

- a. body
- b. lens
- c. shutter
- d. diaphragm
- e. viewer
- f. film holding device

Recognize major characteristics of films including:

- a. color
- b. black/white
- c. speed
- d. type (slides, prints)
- e. ease of development
- f. size (35mm, disc, instant, etc.)

Select appropriate film for purpose

Use a 35 mm camera determining/defining/adjusting:

- a. F-stop
- b. shutter speed
- c. film speed
- d. depth of field
- e. contrast (b/w)
- f. graininess
- g. special effects (panning, shading, etc.)

Identify the steps in taking a picture

Explain important accessories for cameras and purpose including:

- a. tripods
- b. extension tubes
- c. telephoto lenses
- d. macro lenses
- e. filters
- f. cleaning kit
- g. flashes

Describe methods for photographing wildlife, landscapes, people, and indoor versus outdoor subjects.

Operate common video cameras



Competency: Drive a truck or bus

- Tasks:**
- Check all engine fluids
 - Operate a three speed manual transmission
 - Operate a four speed manual transmission
 - Practice caution while transporting passengers
 - Engage four-wheel drive
 - Use winch

Competency: Drive a three-wheeler, four-wheeler or other ATC

- Tasks:**
- Wear a helmet
 - Operate three-wheeler safely
 - Develop and perform a safety demonstration on three-wheelers
 - Fuel the three-wheeler
 - Operate three-wheeler only in designated areas
 - Tow and back trailer safely

Competency: Use a firearm

- Tasks:**
- Pack and carry a firearm safely
 - Obtain proper ammunition for firearm
 - Load and fire a shotgun using slugs
 - Load and fire a shotgun using buckshot
 - Load and fire a high-powered rifle
 - Clean and care for firearm
 - Store firearm safely

Competency: Operate a boat

- Tasks:**
- Include safety equipment aboard boat
 - Start outboard
 - Change spark plugs
 - Prepare gas and oil mix
 - Operate a boat safely

Competency: Work safely around aircraft

- Tasks:**
- Practice safety around aircraft including:
 - a. boarding helicopters forward of loading doors
 - b. boarding propeller aircraft from the rear
 - c. boarding only on pilot's signal
 - d. wearing seat belt
 - e. not flying flammables in passenger compartment

Competency: Sell books, film, and curios

Tasks:

- Greet the customer
- Stock the merchandise
- Display the merchandise
- Protect merchandise from breakage and theft
- Practice courtesy
- Bag items



Competency: Operate a cash register

Tasks:

- Carefully key the sale
- Count out money to the customer
- Cash out the register
- Deposit receipts
- Change register tape

C. Work Out-of-Doors.

Competency: Backpack

Tasks:

- Identify attributes of quality backpacking gear
- Pack wool, polypropylene, or pile fiber clothing
- Select proper footwear
- Practice low-impact camping

Competency: Hike

Tasks:

- Select proper hiking boots for terrain
- Carry proper clothing for locale
- Pack out all refuse

Competency: Cross-country ski

Tasks:

- Wear proper clothing for skiing
- Wax skis
- Ski with proper technique
- Identify avalanche hazards

Competency: Construct temporary camps

Tasks:

- Build a tent platform
- Erect tent
- Minimize human impact
- Install outhouse

D. Understand the Out-of-Doors.

Competency: Manage flora and fauna

- Tasks:**
- List plant communities and dominant species within a selected park
 - Identify native plant species of a selected area or park
 - Identify plant species toxic to animals and humans
 - Describe interactions between living and non-living components of an ecological system
 - Plan and monitor a controlled burn



Competency: Observe wildlife

- Tasks:**
- Use a spotting scope
 - Use binoculars
 - Identify major species of locale
 - Differentiate among males and females of given species

E. Use First Aid and Survival Skills.

Competency: Use first aid

- Tasks:**
- Prepare and check a first aid kit for various occasions including:
 - a. hiking
 - b. skiing
 - c. driving
 - Check victim's consciousness
 - Check for breathing
 - Check for pulse
 - Check for bleeding
 - Use CPR
 - Use a backboard
 - Transport victim
 - Obtain Red Cross or other recognized certification

Competency: Use wilderness survival techniques

- Tasks:**
- Identify treatment for hypothermia
 - Construct a primitive shelter
 - Construct crude snowshoes
 - Signal an aircraft from the ground

III. Manage, Maintain and Protect the Resource.

Competency: Manage, construct and maintain facilities

- Tasks:**
- Plan and implement an SOEP, Coop or OJT work experience
 - Develop a facility and grounds maintenance schedule
 - Monitor and report facility and grounds maintenance needs
 - Determine need for private contractors
 - Estimate cost of services
 - Maintain and repair water and sewer systems
 - Maintain and repair structures and conveniences
 - Maintain and repair typical park/campground facilities

Maintain grounds and recreation areas
Plan and construct facilities
Make electrical repairs
Form and pour concrete
Maintain roads, culverts and drainage ditches
Observe safety precautions



Competency: Maintain parks and recreation areas

Tasks: Interpret park campground rules and regulations to visitors or co-workers,
and provide user information to the park or campground visitors
Maintain records and develop a plan of day-to-day operation and safety

Maintain:

- | | |
|-----------------------------|----------------------|
| a. canoe routes | g. scenic roads |
| b. cross-country ski trails | h. skiing areas |
| c. cycling trails | i. snowmobile trails |
| d. hiking trails | j. swimming beaches |
| e. historic sites | k. wayside rests |
| f. horseback trails | |

Competency: Protect visitors and park resources

Tasks: List the major liabilities and responsibilities of management for the protection of park
resources and visitors
Post and maintain park directions and warnings
Post park rules and regulations
Administer emergency first aid
Recognize need for medical assistance
Develop plans to protect visitors from dangerous animals and other hazards
Develop plans to protect animals and plants and other resources from visitors
Monitor and supervise camping and fishing areas
Operate and maintain structural fire fighting equipment and tools
Operate and maintain wildland fire fighting equipment and tools
Construct and maintain wildfire protection lanes
Supervise and maintain park sanitation
Explain current fish and game laws
Record information concerning possible parks and recreation violations
Write a citation

Competency: Work with wildlife

Tasks: Practice ethical handling of wildlife
Use a live trap
Approach wildlife carefully
Carry a firearm
Radio tag wildlife
Transport wildlife safely
Use a tranquilizing gun

(A) Competency: Help plan recreational settings

- Tasks:**
- Identify and classify major soil types
 - Read and interpret legal land descriptions
 - Contrast visitor and natural resource (wildlife) carrying capacities of a recreational site
 - Read and interpret maps, charts and aerial photographs
 - Identify principles of recreation management as they relate to protecting the resource
 - Help plan protected wetlands
 - Explain the role of organizations such as sportsmen clubs or organizations like Ducks Unlimited in resource management
 - Perform habitat improvement
 - Cooperate with landowners in habitat improvement
 - Encourage cities and boroughs to become involved in recreational planning
 - Plan public access to recreational settings
 - Develop nature study areas
 - Protect shoreline habitat through zoning
 - Contact legislators concerning planning areas or recreational development
 - Assist in the development of land, wildlife and water resource conservation plans for recreational areas
 - Develop private recreational areas
 - Plan a private camping or picnic area
 - Plan a private recreation lodge or cabin
 - Assess developing a private game farm
 - Assess the profitability of golf courses or other such recreational developments in Alaska
 - Assess the profitability of other resorts in Alaska
 - Assess the profitability of marinas in Alaska



Competency: Incorporate technical information into recreation site management practices

- Tasks:**
- Record scientific data
 - Maintain a current file of technical information
 - Analyze data relative to the operation
 - Assess new practices, equipment and materials based on research or technical information
 - Interpret technical information relative to occupations
 - Participate in a wildlife count

IV. Define the Resource.

Competency: Name Alaska's park and recreation resources

- Tasks:**
- Identify national park areas in Alaska
 - Identify state park areas in Alaska
 - Identify national wildlife refuge areas in Alaska
 - Identify national marine refuge areas in Alaska
 - Identify federal wilderness areas in Alaska
 - Identify Alaska's national forests
 - Identify local recreational sites
 - Identify Alaska's private recreation areas
 - Identify national and state historic sites in Alaska
 - Explain the recreational aspects of Alaska's natural resources

V. Understand the importance of the Resource.

Competency: Understand the importance of parks and recreation areas

Tasks: Explain the importance of recreational opportunities in terms of:

- a. scientific baseline
- b. spiritual value
- c. mental health
- d. resources for the future
- e. tourism
- f. protecting lifestyles and heritage
- g. physical health
- h. artistic, literary, historical, and archaeological values
- i. effects on the ecosystem
- j. commercial enrichment
- k. non-commercial enrichment
- l. wilderness versus public access
- m. leisure time use in the daily, weekly, monthly, and annual personal time budget

Identify major types of recreational setting including:

- a. national parks
- b. state parks
- c. refuges
- d. wilderness areas

Competency: Predict trends in recreation site use

Tasks: Estimate future population trends in recreation in Alaska

Estimate future trends in use of leisure time for Americans

Explain future demands on recreational use of natural resources in Alaska and ways to deal with such demands

VI. Understand competing uses

Competency: Understand controversies related to parks and recreation land use in Alaska

Tasks: Compare and contrast public and private management and regulation of recreational settings

Define the D2 clause of ANSCA

Explain several sides of the parks and land use issue

Explain issues concerning mining in recreation settings

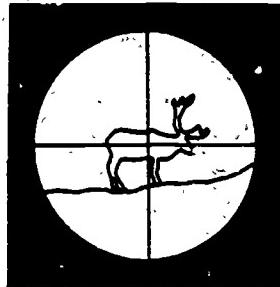
Explain the use of ATVs and aircraft for self-sufficiency

Explain the issue of:

- a. Self-sufficiency hunting, trapping, and fishing in recreation settings
- b. Sports hunting in parks and recreation areas
- c. Designating Native allotment lands in parks and recreation areas
- d. Sports versus commercial fishing in parks and recreation areas
- e. Wilderness versus multiple use in parks and recreation areas



Self-Sufficiency



(A) Denotes more advanced competency or task.

I. Work with the Resource.

Competency: Use skills for self-sufficiency

Tasks: Perform tasks in producing food and fiber for personal use including:

- a. hunting
- b. fishing
- c. gathering
- d. preparing

Explain traditional roles of gathering in Native Alaskan cultures

Identify traditional roles of men and women in self-sufficiency in Native Alaskan cultures

Explain ways to barter or trade self-sufficiency resources

Identify work as:

- | | |
|--------------------|------------------|
| a. animal handler | h. gatherer |
| b. boat builder | i. house builder |
| c. carver | j. hunter |
| d. doll maker | k. skin sewer |
| e. farmer/gardener | l. tanner |
| f. fisherman | m. trapper |
| g. food preparer | n. weaver |

II. Use the Resource.

A. Hunt.

Competency: Understand means and methods of self-sufficiency hunting in Alaska

Tasks: Compare traditional versus contemporary means of hunting

Identify impacts of hunting on the overall resource base -- long term

Explain hunting techniques by species

Appropriately choose weapons

Safely handle weapons

Practice safe hunting techniques

Explain and practice hunting ethics

Competency: Hunt

Tasks: Obtain state hunting license

Identify rules and regulations for area in which you wish to hunt

Identify state regulations for game for which you wish to hunt

Obtain game tags

Wear proper clothing for conditions

Carry first aid and survival gear

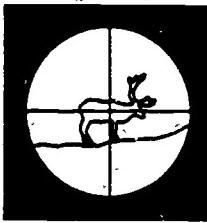
Operate and repair ATC, skiff, or other equipment used in hunting

Set up hunting camp as needed

Identify specifics of behavior of species hunted

Use appropriate hunting methods for species hunted

Use survival skills in the out-of-doors while hunting
Dress game in the field
Cover and preserve the harvest in the field (meat, hide/fur,
hoofs, horns, antlers, etc.)
Transport the harvest



B. Trap.

Competency: Understand means and methods of self-sufficiency trapping in Alaska

Tasks:

- Compare traditional versus contemporary means of self-sufficiency trapping
- Identify impacts of trapping on the overall resource
- Apply conservation and game management principles
- Identify rules and regulations for hunting and trapping
- Compare types of traps
- Equip for trapping
- Preserve and set baits
- Care for and set traps
- Skin animals
- Tan skins
- Market skins and hides
- Cut out and design patterns on skins
- Manage business records related to trapping

C. Gather.

Competency: Understand means and methods of self-sufficiency gathering in Alaska

Tasks

- Equip a self-sufficiency gathering operation
- Choose proper means of gathering
- Compare types of devices for gathering
- Gather safely
- Clean material
- Dry material
- Use survival skills in the out-of-doors
- Care for and store the products gathered

Competency: Gather seafoods and shellfish from beaches

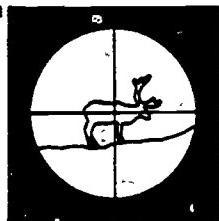
Tasks:

- Obtain proper tools and clothing for shellfish gathering
- Gather shellfish on the beach
- Explain the hazards of paralytic shellfish poisoning
- Obtain proper tools and clothing for seaweed gathering
- Gather seaweed
- Wash seaweed
- Cook, pickle, or preserve seaweed

Competency: Gather and prepare wild medicinals

Tasks:

- Identify materials appropriate for medicinal purposes
- Choose proper means of gathering
- Equip for successful gathering
- Differentiate between poisonous and non-poisonous plants
- Care and store materials gathered
- Use wild medicinals



D. Fish.

Competency: Understand means and methods of self-sufficiency fishing in Alaska

Tasks:

- Care for the catch
- Fish safely
- Choose proper means of self-sufficiency fishing, abiding by state laws
- Equip a self-sufficiency fishing operation
- Safely survive in the out of doors
- Construct fish nets
- Use set nets
- Use dip net
- Eel fish with dip net
- Mend torn nets
- Construct fish wheel
- Use a fish wheel
- Safely operate boats
- Troubleshoot outboard motor
- Explain what to do if you fall overboard

(For commercial fishing, see *Fishing and Fisheries* section)

E. Farm for Self-Sufficiency.

Competency: Prepare garden

(See *Vegetable and Fruit Production* and *Greenhouses* sections of curriculum)

F. Process and Prepare Resources for Self-Sufficiency.

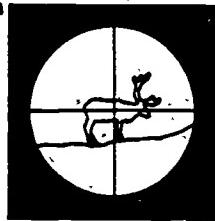
1. Prepare and Store Resources for Self-Sufficiency.

Competency: Clean and prepare meat

Tasks:

- Confirm that the animal is dead
- Prepare carcass according to species and/or traditional methods
- Bleed animal (if applicable)
- Gut animal
- Dispose of entrails sanitarily
- Bone, quarter and/or transport game according to:
 - a. size of animal
 - b. location of vehicle, plane or residence
 - c. products wanted (meat, hide, etc.)

Butcher meat
Wrap and freeze or dry meat
Distribute meat to family, relatives, friends or the community
Prepare and cook meat
Prepare skins, sinew and/or bone for self-sufficiency



Competency: Clean and prepare plants

Tasks: Compare traditional versus contemporary means of wild plant preparation
Prepare plant items in the field
Prepare items at home
Gather and prepare seaweed
Choose recipe

Competency: Smoke foods

Tasks: Cut and dry wood for smoker
Prepare meat or fish for smoking
Apply techniques for smoking
Store smoked foods

Competency: Can foods

Tasks: Follow proper sanitary procedures while canning
Prepare foodstuff to be canned
Can plants/roots/berries, including:
a. obtaining canning jars
b. preparing pressure cooker
c. cooking product
d. placing product in sterilized jars
e. cooling jars
f. sealing jars
g. storing jars

Competency: Dry foods

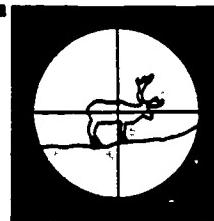
Tasks: Air-dry fish
Dry fruits and/or vegetables
Use electric drier
Store dried foods

Competency: Construct ice cellar

Tasks: Locate site for ice cellar
Dig cellar, steaming permafrost as needed
Scatter dirt
Reinforce cellar walls

Competency: Render seal oil

- Tasks:**
- Obtain seal
 - Skin seal
 - Remove fat and blubber from seal
 - Chop fat and blubber into chunks
 - Place fat and blubber in jars
 - Scoop oil off jars
 - Store oil in a cool place



Competency: Freeze foods

- Tasks:**
- Prepare foods for freezing
 - Wrap foods in freezer wrap, foil or other protective covering
 - Label foods
 - Store in freezer, placing oldest foods in front or on top
 - Determine necessary date of use of frozen products

2. Manufacture and Repair Technology for Self-Sufficiency.

Competency: Construct a summer camp

- Tasks:**
- Mark, fell, and notch logs for cabin
 - Construct cabin floor
 - Identify and cut packed snow for igloo
 - Assemble snow blocks
 - Construct sleeping platform
 - Make and/or install stove
 - Saw, split, and stack firewood
 - Construct outhouse or toilet pit
 - Safely store and discard unburnable refuse

Competency: Construct a winter camp

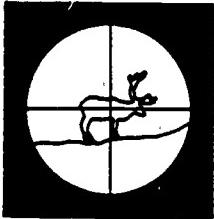
- Tasks:**
- Choose camp site
 - Purchase, haul, and set up tent(s) or construct cabin
 - Secure fuel for lamps and stoves
 - Purchase, haul, and set up tents
 - Construct tent platform
 - Make and/or install stove
 - Saw, split, and stack firewood
 - Construct outhouse or toilet pit
 - Safely store and discard unburnable refuse

3. Utilize Transportation for Self-Sufficiency.

Competency: Maintain a dog team

- Tasks:**
- Train dogs to pull a sled
 - Maintain good rapport with dogs
 - Train dog leader
 - Feed dogs
 - Maintain dogs' health
 - Construct and maintain dog yard

Recognize individual differences/skills per dog
Buy, sell, and/or trade dogs
Make dog harnesses
Make dog collars
Make dog booties



Competency: Construct a boat

Tasks: Design boat
Obtain permits for timber, if necessary
Fell timber
Age timber
Saw boards
Form boards into boat form
Fasten boards
Caulk seams

Competency: Construct a sled

Tasks: Construct a sled for snowmachine

- a. Select wood for sled
- b. Steam and form runners
- c. Form stanchions
- d. Tie stanchions to runners
- e. Form and tie handle bars and cross pieces
- f. Steam top rail and place on sled
- g. Place front plate on runners
- h. Trim rails
- i. Complete brush bow
- j. Rig brakes
- k. Oil sled
- l. Install runners (shoes)
- m. Trim bolts
- n. Construct tow line

Construct a dog sled

(Tasks follow those for snowmachine sled. A dogsled is shorter and lighter.)

4. Manufacture Crafts for Sale (Traditional Arts)

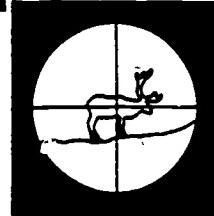
Competency: Complete baskets

Tasks: Sketch out basket before starting
Cure gathered material
Make baskets from material gathered
Decorate baskets
Market products made

Competency: Make items of bone or tusk

Tasks: Sketch out product before starting
Carve ivory or bone from material gathered
Market products made

Competency: Make items of fur and skin



- Tasks:**
- Explain how to select skins
 - Prepare hides
 - Complete patterns
 - Sew product
 - Decorate product
 - Make masks
 - Sew mukluks
 - Sew moccasins
 - Sew parkas
 - Market products made

Competency: Make items of wood

- Tasks:**
- Carve totems
 - Carve and decorate dolls
 - Market products made
 - Compare traditional versus contemporary means of product exchange

G. Use Skills and Equipment for Self-Sufficiency.

Competency: Use wilderness survival techniques

- Tasks:**
- Carry a survival kit
 - Build an outdoor shelter
 - Build a fire from scarce materials
 - Recognize and obtain wild foods by:
 - a. making a snare
 - b. making a spear
 - c. identifying and gathering edible wild plants
 - Construct a signaling device
 - Explain the importance of a positive attitude in wilderness survival
 - Make snowshoes
 - Identify symptoms of and treatment for hypothermia

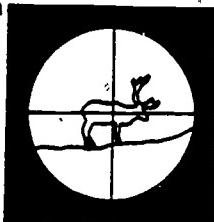
Competency: Use tools for self-sufficiency

Tasks: Use and maintain:

- | | |
|------------------|------------------------------|
| a. axe | h. auger |
| b. saw | i. hammer |
| c. skiff | j. handsaw |
| d. chain saw | k. ice scoop |
| e. canoe | l. ice auger |
| f. kayak | m. rifle |
| g. hunting knife | n. other tools as applicable |

Competency: Build nets

- Tasks:**
- Build nets according to plan
 - Obtain material for net building
 - Determine web size for species to be fished
 - Size nets
 - Compensate for stretching to set knots



Competency: Operate an outboard motor

- Tasks:**
- Install outboard on boat
 - Start outboard both with retractable and auxiliary ropes
 - Change spark plugs
 - Lift motor in shallow water
 - Change propeller
 - Hand-start motor using pull-rope

Competency: Operate an ATV

- Tasks:**
- Operate the vehicle safely
 - Clean and change spark plugs
 - Tow ATV trailer
 - Troubleshoot generator

Competency: Operate snow machine

- Tasks:**
- Operate snow machine safely
 - Operate snow machine at a safe speed
 - Clean and change spark plugs
 - Tow snow machine trailer

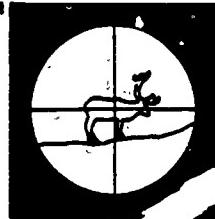
Competency: Troubleshoot a small engine

- Tasks:**
- Compare small engines of:
- a. chainsaws
 - b. snowmachines
 - c. outboards
 - d. A/C generators
- Explain systematic approaches to troubleshooting engines and engine systems
- Check to see if engine is:
- a. getting gas
 - b. getting spark
 - c. flooded
 - d. maintaining compression
- Correct above problems

Competency: Use rifle safely

- Tasks:**
- Never point rifle at human being
- Make sure rifle is unloaded when cleaning and transporting
- Check and double check
- Select correct ammunition
- Sight in rifle on a rifle range
- Break down and clean rifle safely, including:
- a. always pointing weapon away from people
 - b. making doubly sure weapon is unloaded
 - c. cleaning barrel
 - d. cleaning trigger mechanism
 - e. running cleaning wads through weapon
 - f. oil and/or greasing weapon

Competency: Set up and operate radio



- Tasks:**
- Carefully transport and store radio
 - Place antenna in proper alignment for transmission
 - Give location and all pertinent information when transmitting
 - Perform basic radio operation
 - Clean battery terminals
 - Install spare batteries
 - Key mike for emergency signalling

III. Manage and Protect the Resource.

Competency: Manage and protect self-sufficiency resources

- Tasks:**
- Identify state and federal self-sufficiency rules and regulations
 - Explain procedures for adopting and/or modifying such rules and regulations
 - Explain self-sufficiency ethics:
 - a. waste versus need
 - b. using all you take
 - c. leaving animals and plants to reproduce
 - d. animal suffering
 - e. minimizing human impact
 - f. packing out all refuse
 - g. minimizing resource damage
 - h. staying within carrying capacity of resource
 - Explain resource sustainability
 - Participate in local fish and game management and/or Native organization(s)
 - Identify work of agencies involved with self-sufficiency including:
 - a. Alaska Department of Fish and Game
 - b. Alaska Walrus Commission
 - c. Bureau of Land Management
 - d. U.S. Forest Service
 - e. National Park Service
 - f. Native corporations
 - g. Fisheries Advisory Board
 - h. U.S. Fish and Wildlife Service
 - i. International Whaling Commission
 - j. National Marine Fisheries

IV. Define the Resource.

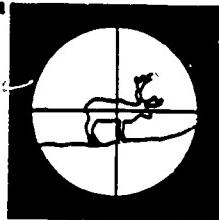
Competency: Understand self-sufficiency land use patterns and values of Alaska Native cultures

- Tasks:**
- Explain Alaska Native religious beliefs, including animism, the role of nature, and totems
 - Explain the role of natural occurrences, like fire, flood, and earthquakes
 - Explain the role of social interaction with neighboring societies, including the roles of trade and profit
 - Identify the roles of Native management organizations, especially Native and village corporations, the Alaska Eskimo Whaling Commission (AEWC), Eskimo Whaling Commission (EWC), Caribou, and the Rural Alaska Resources Association (RARA)

Competency: Understand issues of land ownership and management.

Tasks: Explain land ownership and management issues related to:

- a. Alaska statehood
- b. Alaska Native Claims Settlement Act (ANCSA)
- c. Alaska Native Interest Land Claims Act (ANILCA)
- d. Bureau of Land Management (BLM)
- e. Department of Agriculture
- f. Department of the Interior
- g. The Alaska purchase
- h. Native and village corporations
- i. Native allotments
- j. Fish and Wildlife Service
- k. State land selections



V. Understand the Importance of the Resource.

Competency: Understand the importance of Alaska's resources used for self-sufficiency

Tasks: Explain the commercial value of Alaska's self-sufficiency resources
Explain the non-commercial value of Alaska's self-sufficiency resources
Explain aesthetic and human values represented by Alaska's self-sufficiency resources
Explain cultural values represented by Alaska's self-sufficiency resources
Explain the value of self-sufficiency resources in terms of stability of Alaskan ecosystems

Competency: Understand the economic role of self-sufficiency in the Alaskan economy

Tasks: Describe the economic importance of self-sufficiency in the village economy
Describe the economic importance of viable village economies to the Alaska economy
Identify costs of self-sufficiency on the Alaska economy
Describe sharing and distribution networks

VI. Understand Competing Uses.

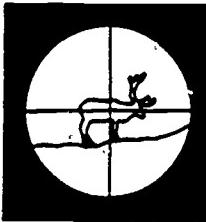
Competency: Understand current competing uses of Alaska's self-sufficiency resources

Tasks: Explain Native versus non-Native uses of Alaska's self-sufficiency resources
Explain sports and commercial fishing versus self-sufficiency fishing
Explain the issue of international high seas fishing versus self-sufficiency fishing
Explain the issue of International Whaling Commission control of whaling
Explain the issue of state control of whaling

Competency: Understand potential uses of Alaska's self-sufficiency resources

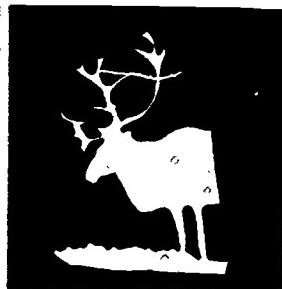
Tasks: Explain under-utilized Alaskan self-sufficiency resources such as:

- a. fresh water
- b. bottom fish
- c. peat
- d. coal
- e. berries
- f. other wild edible plants



Wildlife Use and Management

(A) Denotes more advanced competency or task.



I. Work with the Resource.

Competency: Identify wildlife employment and educational opportunities

Tasks: Identify educational and occupational opportunities
Locate resources for finding employment
Confer with prospective employers

Identify the work of:

- a. biology technician
- b. clerk selling firearms
- c. clerk selling fishing and hunting equip.
- d. equipment and facility maintenance
- e. fish and game biologist
- f. fish and wildlife enhancement tech.
- g. Fish and Wildlife Protection Officer
- h. Fish and Wildlife Service Officer
- i. fish and wildlife technician
- j. fishing guide
- k. hunting guide
- l. lab technician
- m. meat-cutter for wild game
- n. park ranger
- o. park technician
- p. taxidermist
- q. trapper
- r. wildlife management aide
- s. wildlife mgt maintenance worker

II. Use the Resource.

Competency: Use a firearm

Tasks: Demonstrate firearm safety
Use a shotgun
Use a high-powered rifle
Use a handgun
Clean firearms

Competency: Work safely around aircraft

Tasks: Demonstrate safety around aircraft
Do not transport flammables in aircraft

Competency: Cross-country ski and snow shoe

Tasks: Choose proper skis
Choose proper ski wax
Wear proper ski and snow shoe clothing
Select correct-sized skies and/or snow shoes
Carry first aid and survival equipment
Ski or snow-shoe with proper technique

Competencies:

- Drive a three-wheeler
- Construct temporary camps
- Drive a truck
- Take photographs
- Operate a boat
- Spot Hunt for game
- Tan sports-killed game



Tasks for the above competencies may be found under the competencies in the "Outdoor Recreation" and "Self-Sufficiency" areas.

Competency: Guide hunters

Tasks:

- Obtain all necessary permits for business
- Attain a hunting area
- Advertise the operation
- Plan outings well before beginning of season
- Purchase food and equipment
- Obtain first aid certification
- Complete proper paperwork for insurance purposes
- Check clients for proper equipment
- Transport clients
- Model hunting and wilderness ethics for clients
- Assist client with cleaning of game, guns, and equipment
- Cooperate with local law enforcement and conservation officials

III. Manage and Protect the Resource.

Competency: Perform general construction and maintenance duties

Tasks:

- Maintain and repair fences, gates and pens
- Maintain paths, roads and grades
- Maintain and repair waterways, ditches and culverts
- Plan daily maintenance activities
- Construct paths, walks and structures
- Operate arc and oxy-acetylene welding equipment
- Form and pour concrete
- Maintain and repair facilities

Competency: Use research techniques

Tasks:

- Apply research techniques to wildlife, plant and other land resources
- Use a microscope
- Use a hand lens
- Record scientific data
- Compile plant, soil, wildlife data
- Record plant, soil, wildlife data
- Make wildlife observations and keep records
- Interpret scientific reports
- Write scientific reports
- Maintain a collection plot

Competency: Use a natural history library

Tasks: Use bird and fish identification books
Use plant identification keys
Look up state and federal regulations in library



Competency: Work w/ wildlife

Tasks: Explain ways to safely capture wildlife
Explain post-mortem procedures
Measure physiological indices
Analyze scientific data
Capture wildlife, including:
a. using an insect net
b. using a live trap
c. using anaesthetizer

Competency: Maintain and Improve wildlife habitat

Tasks: Analyze habitat
Identify human activities that will pollute or alter wildlife habitat
Research laws to protect wildlife habitat
Enhance habitat if applicable
Work with controlled burns
Work with villages to improve habitat
Explain ethics and value of feeding animals
Identify human/wildlife problems related to human garbage and ways to remedy them
Explain the issue of removing nuisance animals
Analyze ways to improve and protect moose, caribou, and deer habitat

Competency: Maintain and Improve bird habitat

Tasks: Explain physical and biological factors affecting bird habits
Explain artificial rearing and releasing of birds
Explain the purpose of bird banding
Explain ways of improving habitat for birds
Explain ways to take bird censuses by drumming counts
Explain the importance of proper wetlands management

Competency: Work with the public

Tasks: Greet the visitor
Inform visitors of rules and regulations
Remind visitor of safety precautions
Assist visitor with visit to wildlife area
Know local language and customs

Competency: Interpret natural resources to the public

Tasks: Explain natural resources information to visitors
Conduct a slide show
Conduct a nature walk
Answer informational requests over the phone

Competency: Perform law enforcement

- Tasks:**
- Interpret fish and game laws
 - Identify courses of study for basic law enforcement
 - Contact fish and wildlife area users
 - Record wildlife violation information
 - Observe laws and regulations relative to the operation
 - Interpret laws and regulations regarding land use
 - Interpret and apply wildlife and plant laws and regulations
 - Write a citation



IV. Define the Resource.

Competency: Understand basic principles of biology

- Tasks:**
- Describe the basic biology of cells
 - Explain important principles of organic chemistry
 - Explain basic anatomical systems

Competency: Understand principles, definitions, and terms related to wildlife management

- Tasks:** Describe management of:
 - a. upland game
 - b. fur bearers
 - c. sea mammals
 - d. waterfowl

Competency: Evaluate wildlife habitat

- Tasks:**
- Map habitat types using aerial photography
 - Field-check habitat typing
 - Assess relative values for various wildlife species
 - Identify man-made alterations that have changed habitat values and review potential impacts of proposed alterations

Competency: Know wildlife populations

- Tasks:**
- Distinguish sex of wildlife specimens
 - Sample wildlife populations
 - Assemble data in appropriate report

Competency: Know important wildlife quarry

- Tasks:**
- Identify local and regional game animals
 - Identify major local and regional fur bearers
 - Recognize and interpret wildlife game laws, rules and regulations
 - Identify species of wildlife common to Alaska and classify them as game, non-game, endangered, or threatened
 - Describe the characteristics of given wildlife populations
 - Evaluate, improve, and maintain the habitat and physical condition of selected wildlife species

Competency: Know characteristics of birds

Tasks: Explain:

- a. pigmentation changes in birds
- b. the molt process in birds
- c. bird migrations
- d. bird imprint behavior
- e. bird sexual display behavior
- f. bird brood parasitism
- g. the process of egg production and incubation
- h. the process of bird care of young



Competency: Know bird populations

Tasks: Identify:

- a. bird species important to hunters
- b. important game waterfowl
- c. important upland game birds
- d. birds of prey and explain laws relating to them
- e. perching birds

Competency: Know wild plants

Tasks: Identify major plant life in a given area and its relationship to other resources

Name and identify habitats of endangered plant species in Alaska

Describe the characteristics of plant populations

Evaluate, improve, and maintain the habitat and physical condition of selected plant

Competency: Mark or tag animals and plants for identification

Tasks: Construct and erect signs

Capture and tag wildlife species

Observe areas for signs of wildlife and plant population shifts

Observe wildlife and plant life for diseases and pests

V. Understand the Importance of the Resource.

Competency: Know animal characteristics and management factors

Tasks: Explain:

- a. carrying capacities
- b. animal territorialism
- c. the idea of harvestable surplus
- d. the issue of predator control
- e. an area's biotic potential
- f. the relationship of sex ratios to wildlife populations
- g. the relationship of hierarchy of predation on wildlife populations
- h. seasonal variations in wildlife populations

Competency: Plan wildlife management

Tasks: Identify types of values of wildlife resources

Explain history of Alaska wildlife management

Identify the duties of the wildlife manager and wildlife biologist

Identify basic needs of wildlife
Explain how to manage wildlife by intensive and extensive methods
Protect vanishing species
Use field investigational techniques
Identify laws pertaining to wildlife in Alaska



Competency: **Apply scientific procedures and ideas basic to wildlife management**

Tasks:

- Explain the scientific method**
- Use several different types of microscopes**
- Contrast biogenesis and spontaneous generation.**
- Explain the biosynthesis of carbohydrates**
- Identify the parts of the cell**
- Make microscope slides**
- Differentiate cell behavior in different solutions**
- Compare photosynthesis and respiration**
- Describe the replication of DNA**
- Describe the phases of mitosis**
- Explain Mendel's Law of Segregation**
- Explain the theory of natural selection**
- Name important groupings of living things and the system of classification**

VI. Understand Competing Uses.

Competency: **Understand issues related to wildlife management**

Tasks:

Explain:

- a. ways to maintain and improve wildlife habitat
- b. major difficulties in wildlife management
- c. the management of preserves and refuges
- d. problems and prospects of introducing exotic species
- e. methods of keeping track of wildlife populations
- f. ways of live capturing wildlife for study
- g. management practices for moose, deer, wolves, bears, and caribou

Recognize ways to define wildlife range

IV
**Course
Descriptions**

Course Descriptions

The brief course descriptions provide conceptual frameworks for educational planners that seek to design and implement a balanced program in Renewable Natural Resources/Agriculture. Teachers can use these descriptions to organize course offerings in a Renewable Natural Resources/Agriculture education program. These descriptions are examples of content organization and are too brief for purposes of program approval. Local schools will need to be much more definitive regarding the content of their courses than is reflected in these course descriptions.

Introduction to Renewable Natural Resources/Agriculture: A course that provides individuals an overview of land, air & water; forestry; fishing; outdoor recreation; self-sufficiency; wildlife; agriculture mechanics; animal science; plant science; horticulture; and soil science. **Length:** One year or one semester **Grades:** 9-12

Introduction to Renewable Natural Resources: A course that provides an overview of renewable natural resources including world natural spheres, forces in the physical environment, systems in the living environment, and other ecological systems. The course includes instruction in the role of history, ethics, laws, economics, and land ownership on natural resources. **Length:** One year or one semester **Grades:** 9-12

Introduction to Agriculture: A course providing an overview and introduction to agricultural mechanics, horticulture, animal science, soil science/agronomy, and plant science. **Length:** One year or one semester **Grades:** 9-12

Agricultural Mechanics I: A course that prepares individuals to select, operate, maintain, service, sell and use agricultural power units, machinery and equipment. This course includes instruction in safety, use of hand and power tools, construction of agricultural facilities, and mechanical practices associated with farming and ranching. **Length:** One year or one semester **Grades:** 9-12

Agricultural Mechanics II, III & IV: Courses which provide additional instruction in the use of hand and power tools and concentrate on the operation, maintenance and repair of small engines, equipment and tractors. **Length:** One year or one semester each **Grades:** 9-12

Horticulture I: A course that prepares individuals to produce, process and market plants, shrubs, and trees used principally for ornamental, recreational, and aesthetic purposes. The course also prepares individuals to establish, maintain, and manage horticultural enterprises in the areas of olericulture, floriculture, greenhouses, and ornamental horticulture. The course includes instruction in machinery and equipment necessary for each horticultural enterprise. **Length:** One year or one semester **Grades:** 9-12

Horticulture II, III & IV: Courses which provide additional instruction in the horticultural processes of producing, processing, and marketing plants, shrubs and trees. These courses also concentrate on the management of horticultural enterprises. **Length:** One year or one semester each **Grades:** 9-12

Animal Science I: A course that includes the theories, principles, and application of appropriate technical skills that apply to the production and management of animals and animal products. This course includes instruction in animal health, diseases and feeding. **Length:** One year or one semester **Grades:** 9-12

Animal Science II, III & IV: Courses which provide additional instruction in animal production. These courses concentrate on animal management and business aspects of the field. **Length:** One year or one semester each **Grades:** 9-12

Plant Science: A course that includes theories and principles of science and practices involved in the production and management of plants for food, feed, fiber, and soil conservation. The course involves instruction in plant structure, function, growth and reproduction. **Length:** One year or one semester **Grades:** 9-12

Soil Science/Agronomy I: A course that includes content from the physical, chemical, and biological sciences. The course also includes basic principles relating to the determination of soil properties and their conservation and management for crop production, or other purposes. The course emphasizes principles and practices of the development, production, and management of field crops, including plant breeding, plant diseases, soils, insect control, and weed control. **Length:** One year or one semester **Grades:** 9-12

Soil Science/Agronomy II, III & IV: Courses which provide additional instruction in production and management of field crops concentrating on aspects of the soil environment such as analyzing, conserving and managing soil. **Length:** One year or one semester each **Grades:** 9-12

Land, Air and Water Management I: A course that prepares individuals in the principles and practices used in the effective use and protection of land, air and water. The course includes instruction in reading maps; interpreting surveys and land status; testing soil, air, and water; treating air and water; evaluating odors; and protecting the resource. **Length:** One year or one semester **Grades:** 9-12

Land, Air and Water Management II, III & IV: Courses that provide additional instruction in the principles and practices used in the effective use and protection of land, air and water. The courses include instruction in the nature and properties of soil, air and water. The courses include studying the importance of the resource as well as competing uses. **Length:** One year or one semester each **Grades:** 9-12

Forestry I: A course which prepares individuals to produce, protect, and manage timber and specialty forest crops. The course involves maintaining, operating, and repairing forestry equipment and machinery; harvesting and transporting trees and selecting, grading, and marketing forest raw materials for converting into a variety of consumer goods. The course incorporates utilizing the forest for multiple purposes such as game preserves and recreation. Additionally, the course covers instruction in safety; timber management techniques; timber harvesting techniques; use, maintenance and repair of equipment; protection of the resource; fire control; and marketing. **Length:** One year or one semester **Grades:** 9-12

Forestry II, III & IV: Courses which include additional instruction in the production, protection and management of the forest, concentrating on the varying roles of forestry. **Length:** One year or one semester each **Grades:** 9-12

Fishing & Fisheries I: A course which prepares individuals to engage in commercial fishing and to manage fish resources to optimize production. The course includes instruction in safety; seamanship skill; gear building, handling, and maintenance; vessel operation and maintenance; meal preparation; fish handling and processing; fishing techniques; and management of the resource. **Length:** One year or one semester **Grades:** 9-12

Fishing & Fisheries II, III & IV: Courses which provide additional instruction in fishing and managing fishing resources. These courses may include concentrated study on other aspects of the fisheries industry such as hatcheries or fish marketing. **Length:** One year or one semester each **Grades:** 9-12

Outdoor Recreation I: A course that prepares individuals to plan and maintain recreational facilities and programs of public or private agencies. The course includes instruction in park maintenance, handling wildlife and site management practices. **Length:** One year or one semester **Grades:** 9-12

Outdoor Recreation II, III & IV: Courses that provide additional instruction in planning and maintaining recreational facilities. The courses concentrate on recreational site planning and site management practices including the incorporation of technical information into recreational site management. **Length:** One year or one semester each **Grades:** 9-12

Self-Sufficiency I: A course that prepares individuals to provide for all or part of their needs by securing and processing food and fiber for personal use. The course includes instruction in hunting, trapping, fishing, gathering, preparing, farming, storage and resource management. The course also involves construction, maintenance and repair of equipment used for self-sufficiency activities. **Length:** One year or one semester **Grades:** 9-12

Self-Sufficiency II, III & IV: Courses that provide additional instruction in securing and processing food and fiber for personal use, concentrating on the care and management of the resources. **Length:** One year or one semester each **Grades:** 9-12

Wildlife Use and Management I: A course that prepares individuals in the principles and practices used in the production, harvesting and improvement of wildlife resources. The course includes instruction in safety, vehicle and boat operation, guide duties, general construction and maintenance, research techniques, habitat improvement, law enforcement, wildlife biology, and wildlife management. **Length:** One year or one semester **Grades:** 9-12

Wildlife Use and Management II, III & IV: Courses that provide additional instruction in the principles and practices used in the production, harvesting and improvement of wildlife resources. The courses concentrate on applying scientific procedures to wildlife management and understanding the competing issues related to wildlife management. **Length:** One year or one semester each **Grades:** 9-12

V

Curriculum Analysis Matrices

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Curriculum Analysis Matrices

Identified Competencies by Course Offerings

This competency checklist should be used by teachers in identifying competencies to be included in specific classes in Renewable Natural Resources/Agriculture education. This checklist is a curriculum analysis tool for use by teachers in assigning responsibilities for the competencies of a total Renewable Natural Resources/Agriculture education program. All courses taught in the Renewable Natural Resources/Agriculture education program are identified in the columns at the top of the matrix. The individual competencies can be allocated to specific courses. One method for analyzing the competency list is to assign letters where the competency will be introduced (I), taught (T), or mastered (M). Curriculum sequences can be organized through this approach.

To assist teachers to reinforce basic skills instruction, competencies have been cross-referenced with the following academic areas:

Math (M)

Social Studies (SS)

Science (S)

Language Arts (LA)

This will assist local school districts in awarding cross-credit (academic credit) for participation in vocational classes they deem appropriate. The following checklists are also cross-referenced with pre-employment competencies and student leadership competencies. The Job Training Partnership Act provides funds to train economically disadvantaged youth to enter and succeed in employment. Each Private Industry Council responsible for administering these funds adopted youth pre-employment competencies as one of the measures for positive termination for program participants. The other measures are attained through unsubsidized employment, or through another training program.

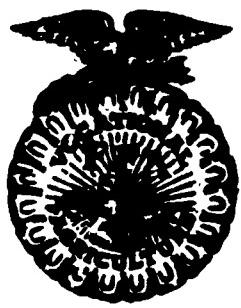
The following categories of work-related knowledge must be evaluated and measured in the course of a participant's enrollment in a JTPA program:

1. **Pre-Employment Competencies**, which require the participant to demonstrate the skills and knowledge necessary to identify career objectives, seek and obtain employment and understand job performance.
2. **Work Maturity Competencies**, which require the participant to demonstrate the ability to apply skills in a training position.
3. **Educational Skills Competencies**, which require the participant to demonstrate basic computation and communication skills necessary to enter the labor market.
4. **Occupational Skills Competencies**, which require the participant demonstrate proficiency in those skills necessary to maintain employment in a specific occupation or occupational cluster.

The pre-employment and work maturity competencies have been specifically cross-referenced in this curriculum so that natural resource instructors could specify where these competencies are integrated into the curriculum. Student leadership programs are designed to be an integral part of the curriculum. The competencies are reinforced by student participation in approved student organizations such as Future Farmers of America (FFA). The student leadership competencies have been cross-referenced in this handbook to assist the natural resource instructor in identifying specifically where these competencies will be taught.

FUTURE FARMERS OF AMERICA (FFA)

Future Farmers of America (FFA) is for students enrolled in secondary and postsecondary vocational courses in natural resources and agriculture. Through planned chapter activities, FFA develops the "whole" student, social and leadership abilities as well as vocational skills. The FFA motto is:



Living to Serve

Learning to Do

Doing to Learn

Earning to Live

FFA's term "agriculture" refers to what is, for this curriculum, "Renewable Natural Resources/Agriculture." FFA's aims and purposes are:

1. To develop competent and aggressive agricultural leadership.
2. To create and nurture a love of country life.
3. To strengthen the confidence of students of vocational agriculture in themselves and their work.
4. To create more interest in the intelligent choice of agricultural occupations.
5. To encourage members in the development of individual occupational experience programs and establishment in agricultural careers.
6. To encourage members to improve the home and its surroundings.
7. To participate in worthy undertakings for the improvement of the industry of agriculture.
8. To develop character, train for useful citizenship and foster patriotism.
9. To participate in cooperative effort.
10. To encourage and practice thrift.
11. To encourage improvement in scholarship.



**Major components of the
Natural Resources/
Agriculture Program**

KEY

- M Math
- S Science
- LA Language Arts
- SS Social Studies
- * Pre-Employment Competencies
- + Student Leadership Competencies

Recommended Competencies by Course Offerings

Competencies

		LEADERSHIP/CITIZENSHIP					
* +		Understand leadership					
LA * +		Use effective leadership skills					
SS +		Use parliamentary procedure					
* +		Demonstrate initiative and productivity					
* +		Demonstrate work maturity					
* +		Be honest					
* +		Be reliable and dependable					
LA * +		Solve problems					
* +		Be assertive					
* +		Maintain good personal relations					
LA * +		Follow verbal and written directions					
* +		Deal effectively with clients					
* +		Understand how to be an entrepreneur					
		Employability Skills					
S *		Work safely					
S *		Prevent work-related injuries					
SS *		Follow OSHA guidelines					
S *		Maintain good health for effective job performance					
SS *		Identify personal responsibilities related to employment					
LA * +		Identify career choices					
S,SS +		Identify jobs in renewable natural resources/agriculture					

Recommended Competencies by Course Offerings

Competencies

LA * +	Prepare a resume and job application					
LA * +	Write a cover letter					
LA * +	Prepare for an interview					
LA *	Follow up the interview					
* +	Understand employee rights and responsibilities					
LA *	Identify proper job resignation procedures					
INTRODUCTION TO NATURAL RESOURCES						
I. What studying natural resources can and cannot do for you.						
LA ,SS * +	Recognize employment opportunities in natural resources					
II. An overview of natural resources.						
S,SS	Define terms related to natural resources					
S	Define the major world natural spheres					
S	Define major forces in the physical environment					
S	Define important systems in the living environment					
S	Define the role of water resources in natural systems					
S	Define ecological systems in streams, lakes, bays, and inlets					
S	Apply ecological principles					
S	Define the role of plant and animal succession in the natural world					
SS, S	Define important communities in the natural world					
SS,S	List Alaska's important natural resources					
III. History and ethics.						
SS, LA	Understand the pre-contact human interaction with natural resources					

Recommended Competencies by Course Offerings

Competencies

SS,LA	Understand pre-contact human ethics related to natural resources					
SS,LA	Understand expansion-era human ethics related to natural resources					
SS,LA	Understand Russian-era human ethics related to natural resources in Alaska					
SS,LA	Understand the human interaction with natural resources in Alaska from purchase to statehood					
SS,LA	Understand human ethics related to natural resources in Alaska from purchase to statehood					
S,SS LA	Understand human interaction with natural resources in Alaska from statehood to present					
S,SS LA	Understand human ethics related to natural resources in Alaska statehood to present					
M,SS LA	Understand the role of humans in resource issues					
SS,LA	Understand the management of public lands					
SS,LA	Contrast rural and urban relationships					
S,SS	Understand the importance of planning in proper resource management					
S,SS LA	Understand principles of conservation					
S,SS, LA	Understand the conservation movement in the U.S.					
SS, LA	Understand major social and economic factors concerning conservation					
S	Understand human effects on streams and lakes					
S,SS	Understand technological impacts of highways					
S	Understand how to control hazardous wastes					
IV. Laws, economics, and land ownership.						
S, SS, LA	Understand laws related to Alaska's natural resources					
SS, LA	Understand issues related to land ownership and management					
SS, LA	Understand economics related to natural resources					

Recommended Competencies by Course Offerings

Competencies

	Agricultural Mechanics I:						
S	Maintain shop safety						
S, M	Use hand tools						
S, M	Use power tools						
S	Use ropes effectively						
S, M	Perform basic drafting procedures						
	Agricultural Mechanics II:						
S, M, LA	Use service and repair manuals						
M, LA	Order parts, supplies, equipment and services						
M, LA	Maintain maintenance and service records						
LA, S	Operate an agricultural wheel-type tractor						
S, M	Arc weld						
S, M	Oxy-acetylene cut and weld						
S, M	Maintain and service lubrication system						
	Agricultural Mechanics III:						
S, M	Perform general shop tasks						
S, M	Perform basic wiring						
S, M, LA	Operate and service small motors						
S, M, LA	Operate and service small gasoline engines						
S, M	Perform more advanced arc welds						
S, M	Mig weld						
S, M	Tig weld						

Recommended Competencies by Course Offerings

Competencies

S, LA	Operate an agricultural wheel-type tractor under field conditions				
S, M	Identify equipment requirements				
S	Operate agricultural field equipment				
S, M	Adjust and repair agricultural equipment				
S, M	Maintain and service fuel system				
S, M	Maintain and service brake systems				
S, M	Troubleshoot gas and diesel power units				
S, M	Maintain and service the ignition system				
Agricultural Mechanics IV:					
S, M	Service manual transmissions and differentials				
S	Maintain and service clutches				
S, M, LA	Maintain and service electrical system accessories				
Animal Science I:					
S, LA	Understand principles and terms related to animal science				
S, M, LA	Select animals				
Animal Science II:					
S	Understand animal health principles and common diseases				
S, M, LA	Feed animals				
Animal Science III & IV:					
S, M, LA	Manage animals				
PLANT SCIENCE					
	Plant structure, function, growth, and reproduction				

Recommended Competencies by Course Offerings

Competencies

S	Recognize basic parts of plants and their functions						
S	Recognize plants by growth habits						
	Plant Taxonomy						
S, M	Use plant keys						
S, M	Classify plants						
	Plant Environment						
S, M	Understand the nature and properties of soils						
S	Understand influences of moisture, light, temperature, and air						
S, M	Understand how to control plant growth						
	Plant Health						
S	Understand characteristics of a healthy plant						
S	Understand environmental factors causing plant disorder						
	Soil Science/Agronomy I:						
S	Understand the function of soils						
	Soil Science/Agronomy II:						
S, M	Understand physical and chemical properties of soil						
	Soil Science/Agronomy III:						
S	Understand properties of the soil profile						
M, LA	Understand land capability						
S, M	Use soil surveys						
S, LA	Utilize land descriptions						
	Soil Science/Agronomy IV:						

Recommended Competencies by Course Offerings

Competencies

S	Use soil conservation and management techniques					
S, M	Test soil					
	HORTICULTURE					
	Ornamental Horticulture					
S	Understand terms and definitions related to ornamental horticulture					
SS *	List types of ornamental horticulture businesses					
S	Identify parts of plants					
S	Classify, identify and determine the functional uses of ornamental plant materials					
SS,LA	Value attractive lawns and turf					
S,SS	Understand state and federal regulations related to the operation of a horticulture business					
M,LA	Prepare a landscape plan					
S, M	Understand the role of soil fertility in ornamental horticulture					
S, M	Prepare a site for landscaping					
S	Use specific tools in planting					
S,M	Operate and maintain lawn maintenance equipment safely					
S, M	Prepare growing media and seedbeds					
S	Handle plants upon arrival					
S	Plant shrubs and trees					
S, M	Plant and maintain turf					
S	Maintain landscape site					
S,M	Apply fertilizer					
S, M	Control pests and diseases					

Recommended Competencies by Course Offerings

Competencies

S	Prune ornamentals						
S, M	Irrigate ornamentals						
S, M	Handle packing, temporarily storing, and unpacking of plants						
S, M LA	Harvest and market nursery stock						
S	Perform special ornamental management practices						
S, M	Irrigate ornamental plants						
S, M LA	Design a lawn maintenance plan						
S, M LA	Design and install interior plantscaping						
S, M	Consider special characteristics of Alaska's climate						
Floriculture							
S	Define terms and principles of floriculture						
S, M LA	Plan the floriculture venture						
S, M	Prepare the growing medium						
S	Propagate plants						
S, M	Manage the crop						
S, M	Perform special management practices						
S	Use special harvest methods						
S	Design with flowers and foliage						
LA	Sell products						
Vegetable and Fruit Production (Olericulture)							
S, M	Define basic olericulture terms and techniques						
S	Assess the potential for personal use and commercial agriculture						

Recommended Competencies by Course Offerings

Competencies

S, M	Plan the operation				
S, M	Prepare the growing medium				
S, M	Plant crops				
S, M	Manage crop production				
S	Control pests and diseases				
S, M	Harvest crops				
	Greenhouses				
S, M	Understand principles of greenhouse management				
S, M	Plan, construct, and maintain greenhouse physical facility				
S, M	Identify, select, operate, and maintain greenhouse equipment				
S, M	Control greenhouse environment				
S, M	Produce greenhouse crops				
	LAND, AIR AND WATER				
	I. Work with the Resource.				
SS *	List employment and educational opportunities in fields related to land, air, and water				
	II. Use the Resource.				
	A. Read maps, surveys and determine land status.				
M, SS	Use a map projection				
S, M	Use a compass				
SS, M	Interpret maps				
M	Measure horizontal distances				
M	Measure vertical distances				

Recommended Competencies by Course Offerings

Competencies

M	Measure angles				
M	Record surveying data				
M *	Assist surveyor				
SS,LA	Determine land status				
	B. Test soil.				
S, M	Test soil				
	C. Test water.				
S, M	Test and treat water				
S, M	Meet drinking water standards and abide by regulations				
S	Produce potable water				
S, M	Complete calculations and measurements in hydraulics				
S,SS	Understand water use laws in Alaska				
	D. Test air.				
S, M	Understand components of the atmosphere				
S,M	Sample gases for ambient particulate level				
S, M	Evaluate sources of combustion				
S, M	(A) Select and install air pollution sampling equipment				
S, M	Record and analyze particulate and gaseous sampler data				
S, M	Understand the effects of topography and weather on air pollution				
S,M	Evaluate odors				
S, M	Test noise				

Recommended Competencies by Course Offerings

Competencies

	III. Manage and Protect the Resource.				
S	Protect land resources				
S, M	Protect water resources				
S, M	Protect air resources				
	IV. Define the Resource.				
S	Understand the nature and properties of soil and soil formation				
S	Understand components of air and their role				
S	Understand components of water				
	V. Understand the Importance of the Resource.				
S,SS	Understand the importance of land resources				
S,SS	Understand the importance of water resources				
S	Understand the importance of air resources				
	VI. Understand competing uses.				
S,SS	Understand human-caused problems associated with land, air, and water				
S,SS	Understand the effects of air polluting particulates and gases				
S, M, SS	Understand acid rain concerns				
S, M SS	Understand effects of thermal pollution on lakes and streams				
S	Identify effects of water-polluting substances				
S,SS	Understand impacts of power generation				
	FISHING AND FISHERIES				
	I. Work with the Resource.				
SS	Identify employment and educational opportunities in fishing and fisheries				

Recommended Competencies by Course Offerings

Competencies

	II. Use the Resource.						
	A. Safety						
S	Practice personal safety and accident prevention						
S, M	Use boating safety and seamanship skills						
	B. Seamanship.						
S, M	Use a tide book, nautical charts, and coast pilot						
S, M	Check out and get a vessel underway						
S, M	Maneuver a vessel						
S, M	Use the rules of the road						
S, M	Use modern electronic systems						
S, M	Use marine lights and sound signals						
SS	Get along with other members of crew						
S, M	Anchor vessel						
S, M	Dock a vessel						
	C. Building, handling, and maintaining gear.						
S, M	Build, mend and repair nets and lines						
S, M	Operate and maintain gear hydraulics						
S, M	Maintain and operate processing equipment						
	D: Vessel operation and maintenance.						
S	Conduct deckhand duties						
S, M	Maintain vessels						
S	Prevent marine corrosion problems						

Recommended Competencies by Course Offerings

Competencies

S	(A) Repair engine problems				
	E. Other duties and skills.				
S, M LA	Prepare meals aboard the vessel				
M, LA	(A) Maintain and analyze records related to fishing				
M, LA	(A) Secure loans from bank and state agencies				
M	(A) Compute the tax liabilities of a fisherman				
	F. On-board fish handling.				
S	Understand the importance of fish quality				
S, M	Handle fish correctly aboard the vessel				
S	Practice vessel sanitation				
S	Store fish aboard the fishing vessel				
	G. Marine Products Processing.				
S	Process fish				
S, LA	Handle and process marine products				
S, M	Maintain fish quality during storage and shipping				
S	Sanitize seafood plant				
	H. Actively fish.				
S, M	Net fish				
S,	Line fish				
S, M	Pot and trawl fish				
M	(A) Analyze economic factors related to a mariculture venture				
M, LA	(A) Plan and implement mariculture venture, SOEP, Coop or OJT				

Recommended Competencies by Course Offerings

Competencies

S	(A) Locate feasible mariculture site					
S, M	(A) Construct and maintain mariculture site					
S, M	(A) Stock and maintain species in cages					
S	(A) Harvest mariculture fish and/or material					
S, M	(A) Increase production as feasible					
	III. Manage and Protect the Resource.					
SS, LA	Understand the important state and federal regulations and regulatory agencies pertaining to fisheries					
SS, LA	Understand the important state and federal regulations and regulatory agencies pertaining to navigation					
S, M LA	Understand fish management practices					
S, LA	(A) Define important factors for hatchery placement					
S, M	Define important hatchery techniques					
S, M	Work in a hatchery					
S, M	Care for fish in a hatchery					
S, M	Manage salmon					
	IV. Define the Resource.					
S	Understand Alaska's water resources					
S	Identify attributes of Alaska's commercial fish species					
S	Understand the life cycles of Pacific salmon					
	V. Understand the Importance of the Resource.					
SS, S M	Understand the economic importance of fishing to Alaska					
SS, LA	Understand the traditional importance of fishing to Alaska					
SS	Understand the international importance of fishing to Alaska					

Recommended Competencies by Course Offerings

Competencies

	VI. Understand competing uses.					
S,SS	Understand the role of fisheries management					
S,SS	Identify forces competing for Alaska's fishery resources					
	FORESTRY, PRODUCTION AND PROCESSING					
	I. Work with the Resource.					
M,LA *	Understand employment and educational opportunities in forestry management, production, and processing					
	II. Use the Resource.					
S,LA	Understand timber management techniques					
S,LA	Understand timber harvesting techniques (basics of silviculture)					
S, M	Complete a rough land survey					
S, M:	Measure a stand (cruise timber)					
S, M	Scale logs					
M	Survey roads					
S *	Use an axe					
S *	Use a chain saw					
	III. Manage and Protect the Resource.					
S, M	Improve stands					
S	Control undesirable brush and weeds					
S	Reforest					
S	Manage insects					
S	Control forest diseases					
S	Understand principles of fire ecology					

Recommended Competencies by Course Offerings

Competencies

S	Understand basic tenets of wildland fire control					
S, M	Understand fire behavior					
S	Use the pulaski, fire rakes, and fire shovels					
S	Set up pumps					
S, M	Lay hose					
S, M	Control fires					
S	Control other dangers to forests					
	IV. Define the Resource.					
S	Understand major principles of botany					
S	Understand main principles of forest ecology					
S, M	Understand types of soils and uses					
S	List parts of trees and shrubs					
S	Understand stages of commercial timber stand development					
S	Identify major commercial hardwood and softwood species					
S, LA	List types and geographic area of trees (and identify economic potential) for different parts of Alaska					
S, LA	List forest users and management services					
	V. Understand the Importance of the Resource.					
S, SS LA	Identify the role of forestry products					
SS, LA	Understand various roles of forestry					
	VI. Understand competing uses.					
S, SS LA	Understand competing uses of Alaskan forests					

Recommended Competencies by Course Offerings

Competencies

OUTDOOR RECREATION						
I. Work with the Resource.						
SS,LA *	Understand employment and educational opportunities in parks and outdoor recreation					
	II. Use the Resource.					
	A. Work with People.					
LA *	Manage visitor services					
SS,LA	Speak a second language					
	B. Use Outdoor Recreation Equipment.					
S, M	Operate and maintain equipment and tools					
S, M	Take photographs and/or assist visitors in doing so					
S	Drive a truck or bus					
S	Drive a three-wheeler, four wheeler or other ATC					
S	Use a firearm					
S	Operate a boat					
S	Work safely around aircraft					
LA	Sell books, film, and curios					
M	Operate a cash register					
	C. Work Out-of-Doors.					
S	Backpack					
S	Hike					
S	Cross-country ski					
S	Construct temporary camps					

Recommended Competencies by Course Offerings

Competencies

	D. Understand the Out-of-Doors.						
S, M	Manage flora and fauna						
S	Observe wildlife						
	E. Use First Aid and Survival Skills.						
S, M	Use first aid						
S, LA	Use wilderness survival techniques						
	III. Manage, Maintain and Protect the Resource.						
S, LA	Manage, construct and maintain facilities						
S	Maintain parks and recreation areas						
S, M, SS	Protect visitors and park resources						
S, M	Work with wildlife						
S, M, LA	(A) Help plan recreational settings						
SS, LA	Incorporate technical information into recreation site management practices						
	IV. Define the Resource						
M, SS	Name Alaska's park and recreation resources						
	V. Understand the Importance of the Resource.						
M, SS	Understand the importance of parks and recreation areas						
S, SS, LA	Predict trends in parks and recreation use						
	VI. Understand competing uses						
S, SS	Understand controversies related to parks and recreation land use in Alaska.						

Recommended Competencies by Course Offerings

Competencies

SELF-SUFFICIENCY							
I. Work with the Resource.							
S, SS	Use skills for self-sufficiency						
II. Use the Resource:							
A.	Hunt.						
S, SS	Understand means and methods of self-sufficiency hunting in Alaska						
S	Hunt						
B.	Trap.						
S, M	Understand means and methods of self-sufficiency trapping in Alaska						
C.	Gather.						
S	Understand means and methods of self-sufficiency gathering in Alaska						
S	Gather and store seafoods and shellfish from beaches						
S	Gather and prepare wild medicinals						
D.	Fish.						
S	Understand means and methods of self-sufficiency fishing in Alaska						
E.	Farm for Self-Sufficiency.						
S	Prepare garden						
F.	Process and Prepare Resources Self-Sufficiency .						
1.	Prepare and Store Resources for Self-Sufficiency.						
S	Clean and prepare meat						
S	Clean and prepare plants						
S	Smoke foods						

Recommended Competencies by Course Offerings

Competencies

S	Can foods				
S	Dry foods				
S, M	Construct ice cellar				
S	Render seal oil				
S, M	Freeze foods				
	2. Manufacture and Repair Technology for Self-Sufficiency.				
S,SS	Construct a summer camp				
S,SS	Construct a winter camp				
	3. Utilize Transportation for Self-Sufficiency				
S	Maintain a dog team				
S	Construct a boat				
S, M	Construct a sled				
	5. Manufacture Crafts for Sale.				
S,SS	Complete baskets				
S,SS	Make items of bone or tusk				
S,SS	Make items of fur and skin				
S,SS	Make items of wood				
	G. Use Skills and Equipment for Self-Sufficiency.				
S	Use wilderness survival techniques				
S,SS	Use tools for self-sufficiency				
S, M	Build nets				
S	Operate an outboard motor				

Recommended Competencies by Course Offerings

Competencies

S	Operate an ATV				
S	Operate snow machine				
S	Troubleshoot a small engine				
SS	Use rifle safely				
SS,LA	Set up and operate radio				
	III. Manage and Protect the Resource.				
SS,LA	Manage and protect self-sufficiency resources				
	IV. Define the Resource.				
SS,LA	Understand self-sufficiency land use patterns and values of Native American cultures				
SS,LA	Understand issues of land ownership and management				
	V. Understand the importance of the Resource.				
SS,LA	Understand the importance of Alaska's resources used for self-sufficiency				
M,SS, LA	Understand the role of self-sufficiency in the Alaskan economy				
	VI. Understand competing uses.				
SS,LA	Understand current competing uses of Alaska's self-sufficiency resources				
SS, LA	Understand potential uses of Alaska's self-sufficiency resources				
	WILDLIFE				
	I. Work with the Resource.				
SS,LA	Identify employment and educational opportunities related to wildlife				
	II. Use the Resource.				
S	Use a firearm				
S, LA	Work safely around aircraft				

Recommended Competencies by Course Offerings

Competencies

S	Cross-country ski and snow shoe				
S	Drive a three-wheeler				
S	Construct temporary camps				
S, M	Drive a truck				
S, M	Take photographs				
S	Operate a boat				
S	Backpack and/or camp out				
S	Sports hunt for game				
S	Tan sports-killed game				
LA, S	Guide hunters				
III. Manage and Protect the Resource.					
S, M	Perform general construction and maintenance duties				
S, M LA	Use research techniques				
S, LA	Use a natural history library				
S, M	Work with wildlife				
S, M, LA	Maintain and improve wildlife habitat				
S, M, LA	Maintain and improve bird habitat				
SS, LA	Work with the public				
SS, LA	Interpret natural resources to the public				
M, LA	Perform law enforcement				
IV. Define the Resource.					
S	Understand basic principles of biology				

Recommended Competencies by Course Offerings

Competencies

VI

**Sample
Skills Card**

Sample Skills Card

This section of the guide provides teachers with an example of an instrument for evaluating the effectiveness of instruction. The skills record allows teachers to assess competency at four levels of proficiency. Teachers are encouraged to construct their own skills performance record using the competency lists in the curriculum section of this guide.

Instructions for Use

The list of vocational skills/traits was developed from a task analysis of a natural resource competency.

LEVEL CODE KEY:

- 1 **Introductory Level:** Can do simple parts of task. Needs to be told/shown how to do most of the task. Needs extremely close supervision.
- 2 **Minimum Level:** Can do most parts of the task. Needs help only with most difficult parts. Needs close supervision.
- 3 **Average Level:** Can do all parts of task. Needs only spot-check of completed work. Meets local demands for speed and accuracy. Needs moderate job entry supervision.
- 4 **Proficiency Level:** Can complete task quickly and accurately. Can direct others in how to do the task. Needs little supervision.

DIRECTIONS: The instructor/employer may write, date and initial in appropriate square.

Competency: Understand leadership

Tasks:

1 2 3 4

Attain self-worth by:

- a. working in committees
- b. defining self-esteem and explaining its importance
- c. practicing eye contact
- d. greeting others with a firm handshake
- e. using presentation skills

Refine social skills

Refine communications skills

Comments:

VII

**Suggested
Resources**

Suggested Resources

The first section has been characterized by media type to facilitate teacher use: resource libraries, publishers of texts and instructional materials, state resources, associations, periodicals, special books/pamphlets, media, and materials suppliers. The second section is organized according to units. They are not necessarily duplicates.

The Alaska Department of Education has not formally reviewed nor approved all the resources listed in this section. Teachers are encouraged to preview materials before using them in the classroom and/or personally contact teachers of similar disciplines for recommendation regarding resources.

Resources by Type of Resource

Resource Libraries

Alaska Vocational Materials Library
Office of Adult and Vocational Education
Alaska State Department of Education
Box F
Juneau, AK 99811
(907) 465-2980

- Alaska Energy Education Series
- Appropriate Technology for Alaskans
- Basic Skills For The Trades
- Building in the North
- Choices & Challenges: A Young Man's and Teen Woman's Journal for Self-Awareness and Personal Planning
- Cooperative Education and On-The-Job Training Handbook
- Home-Based Business Resources
- Industrial Education Curriculum
- Industrial Education Resources
- Local Advisory Committee: Handbook for Vocational Administrators
- Pre-Employment Competencies Resource Guide
- Safety and School Shop Planning
- STARS: Secondary Training For Alaska
- Vocational Education Administration Handbook

The Library maintains curricula for all vocational areas. Resources are loaned for a 2 month review period. There are also many materials which may be purchased from the Library's special collections. Some materials are available free of charge.

The Library's catalog is computerized and may be operated on an Apple Computer using Appleworks Software. The catalog may be obtained by sending \$10.00 (please make your check payable to the South East Regional Resource Center) or by sending five blank disks for duplication.

Alaska Career Information System
Office of Adult and Vocational Education
Alaska Department of Education
Box F
Juneau, AK 99811
(907) 465-2980

- Comprehensive career guidance system developed by Alaskans and for Alaskans seeking occupational and educational opportunities in and out of Alaska.

Alaska Department of Fish and Game
Library
333 Raspberry Road
Anchorage, AK 99518
(907) 267-2306

- Computerized reference listing of general interest publications, technical publications, research and other fish and game resources. (see PTL Pamphlet). Excellent resource for non-game resources.

Publishers

Alaskabooks
P.O. Box 1494
Juneau, AK 99802
(907) 586-3067

Alaska Fieldbooks Co., Ltd.
P.O. Box 1044
Anchorage, AK 99510
(907) 274-5742

Ken Cook Company
9929 West Silver Spring Road
Milwaukee, WI 53225
(414) 466-6060

Delmar Publishers
2 Computer Dr. West
Albany, NY 12212
Excellent Textbooks

Fairmont Press, Inc.
700 Indian Trail
Liburn, GA 30247
(404) 925-9388

Glencoe Publishing Co.
Bennett and McKnight Division
15319 Chatsworth Street
Mission Hills, CA 91345

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

Harper and Row Publishers, Inc.
10 East 53rd Street
New York, NY 10022
(212) 207-7099

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
Excellent Source

Houghton Mifflin Publishing Co.
777 California Ave.
Palo Alto, CA 94304

National Farm Book Company
P.O. Box 206-5149 Highway T
Amherst, Wisconsin 54406
Listing of Agriculture books

National Textbook Company
4255 W. Touhy Ave.
Lincolnwood, IL 60646-1975
(312) 679-5500

Prakken Publications, Inc.
P.O. Box 8623
Ann Arbor, MI 48107
(313) 769-1211

Prentice-Hall Publishing Co.
Box 1050
Mt. Kisco, NY 10549

South-Western Publishing Co.
5101 Madison Road
Cincinnati, OH 45227

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
*Excellent Source of Inexpensive
Items Request Free Catalog*

Technical Publishing
1301 South Grove Ave.
P.O. Box 1030
Barrington, IL 60010
(312) 381-1840

Timber Press
P.O. Box 1632
Beaverton, OR 97075
800-323-4900

VGM Career Books
Division of National Textbook Co.
4255 West Touhy Ave.
Lincolnwood, IL 60646

John Wiley and Sons, Inc
605 Third Ave.
New York, NY 10016
(212) 207-7099

State Resources

Alaska Dept. of Education
Box F
Juneau, Alaska 99811

- Village Alaska
- Stock, Corporations, and the Native Land Claims Settlement

Alaska Energy Library
Alaska Department of Community and
Regional Affairs
949 E. 36th Street, Suite 403
Anchorage, AK 99508

Alaska Health Sciences Library
3211 Providence Drive
Anchorage, AK 99508

Alaska Resources Library
U.S. Department of Interior
Bureau of Land Management
701 C Street
Box 36
Anchorage, AK 99513
(907) 271-5025

Alaska State Film Library
West International Airport Road
Anchorage, AK 99518
(907) 561-1132

Biomedical Library
901 Koyukuk Avenue South
Fairbanks, AK 99701

**National Center for Research in
Vocational Education**
The Ohio State University
1960 Kenny Road
Columbus, OH 43210

**Northwestern Vocational Curriculum
Coordination Center**
St. Martin's College
Lacey, WA 98503

- References, maps, greenhouse construction and other energy related materials

- Journals and magazines in the area of job Safety and health

- Information center to assist in serious research involving natural resources in Alaska. Provides computer searches and interlibrary.

- Films and videos on agriculture, horticulture and greenhouse construction and management
 - "Animal Migrations" (#34886)
 - "Animal World-Polar Bear" (#40289)
 - "Bear Country" (#30516)
 - "Caribou Crisis, Eskimo Perspective" (#84457)
 - "Caribou, a Human Problem- What to do with Tongass Deer" (#44149)
 - "Caribou Hunting At The Crossing Place" (#44194)
 - "Eskimo Changing Culture" (#33482)
 - "Eskimo Hunters" (#30288)
 - "Eskimo Tarpon (Sheefish)" (#33482)
 - "Fur Seals of the Pribilofs" (#44024)
 - "People of the Yukon Delta" (#40278)
 - "Return of the Muskox" (#84414)
 - "Salmon, Life Cycle of a Sockeye" (#12671)
 - "Seal Island" (#42285)
 - "She Bristol Bay Story" (#54014)
 - "There is No More Fish" (#84283)
 - "The Story of Pink Salmon" (44107)
 - "The Warm Coat" (#24008)
 - "The Web of Life- The Living Tundra" (#44293)

- Books on job health hazards and hazardous materials

- Vocational Education Curriculum Materials database of all 50 states.

- 10-State regional library of vocational materials. Can be accessed through the Alaska Vocational Materials Library.

Alaska Department of Environmental Conservation
P.O. Box O
Juneau, AK 99811
(907) 465-2600/Pub. Information
(907) 465-2621/Library

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, AK 99802
(907) 465-4112

Alaska Department of Labor
Occupational Safety and Health Section
P.O. Box 7-022
Anchorage, AK 99501

Alaska, University of
Institute of Agricultural Sciences
Fairbanks, AK 99701
Also:
University of Alaska Extension Service
and
College of Human and Rural Development

Anchorage Center for Economic Education
School of Business and Public Affairs
University of Alaska
Anchorage, AK 99508
(907) 786-1770

Arizona Center for Vocational Education
Box 6025
Flagstaff, AZ 86011
(602) 523-5442

California Department of Education
721 Capitol Mall
Sacramento, CA 95814-4785

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, CA 93407
Excellent Source

Center for Occupational Research and Development
601 C Lake Air Dr.
Waco, TX 76710
(817) 772-8756

- Materials on pollution, oil spills, hazardous waste regulations for specific pollution type problems
- Provides information on the handling, transportation and disposal of hazardous waste materials
- Provides free information, training and inspections
- Alaska Wildlife Week
- Project Wild
- Provides free information, training and inspections
- Creating A Northern Agriculture
- Publications on agricultural development in Alaska. *Should have all these on the reference shelf.*
- Catalog of publications on many Alaska resources.
- Seaweed Curriculum. Publications on teaching in rural and cross-cultural settings.
- Lending library of films and filmstrips:
"The Big E's, The Climber, More Economics and The Global Society, The Economics of Energy, Economics and The Environment, The Economics of Public Utility Enterprise, The economics of Pollution, The Economics of the Energy Problem, and The Economics of Oceans"
- "Forestry Aid Curriculum for Native Americans"
- Boating The Right Way
- Ekistics: Guide for Interdisciplinary Environmental Curriculum
- Agricultural Mechanics
- Back Pocket Guide to Ornamental Plants
- Basic Pruning Techniques
- Dairy Handbook
- Experiments in Soil Science
- Growing Container Plants
- Landscaping Design
- Nursery Management and Practices
- Propagating Ornamental Plants
- Terrariums And How To Make Them
- Occupational cluster learning packages for Agriculture/Agribusiness

**Curriculum and Instructional Materials
Center(CIMC)
1500 W Seventh
Stillwater, OK 74074-4364**

- Agriculture Department Filing System
- Agricultural Mechanics
- Basic Horticulture
- Farm Business Management
- Horticulture Identification and Judging
- Flange and Forage Plants
- Tool Identification
- Vocational Agriculture I,II,III,IV

**Curriculum Coordinating Unit
Drawer DX
Mississippi State University
Mississippi State, MS 39762**

- A Guide for Teaching Basic Agriculture
- A Guide for Teaching Ag Products and Supplies/Services
- Agricultural Mechanics Instruction
- A Reference for Liming Soils for Greater Profit
- A Reference on Vegetable Production
- Basic Principles of Plant Science

**Curriculum Development Unit
Office of Vocational Education
2024 Capital Plaza Tower
Frankfort, KY 40601**

- Agribusiness Curriculum: 14 modules and instructor manual for horticulture, gardening and groundskeeping Excellent Materials

**Curriculum Materials Service
Vocational Education Building
Colorado State University
Ft. Collins, CO 80523**

- Laboratory Activities in Horticulture

**Curriculum Publications Clearinghouse
Western Illinois University
Horrabin Hall 46
Macomb, IL 61455
(309) 298-1917**

- Agricultural Program Planning Guides
- Vocational-Technical Education Consortium of States (V-TECS) Catalogs of Performance, Objectives and Curriculum Materials for Agriculture/Agribusiness Occupations

**Iowa Association for Vocational
Instructional Materials
208 Davidson Hall
Iowa State University
Ames, IA 50011
(515) 294-6673**

- Planting a Tree or Shrub
- Soil and Water Conservation
- Wildlife-A Product of the Land

**Continuing Education Publications
P.O. Box 1491
Portland, OR 97207**

- Horticulture: Deciduous Trees
- Horticulture Equipment Operation and Maintenance
- Horticulture: Evergreen Trees and Shrubs
- Horticulture: Insects and Diseases
- Horticulture Mechanics
- Identification and Control of Insects, Diseases, and Other Plant Pests
- Introduction To Landscape and Nursery Management
- Landscape Maintenance
- Ornamental Plant Identification
- Plant Propagation
- Weed Identification and Control

Illinois State Board of Education
Adult, Vocational and Technical
Education
Research and Development Section
E-426
100 N First St.
Springfield, IL 62777
(217) 762-4620

- Agricultural Occupations
- Competency-Based Horticulture: Turfgrass Maintenance Worker and Gardening-Groundskeeping

Instructional Materials Laboratory
10 Industrial Education Bldg.
University of Missouri-Columbia
Columbia, MO 65211
(314) 882-2883
Outstanding Source

- Catalog of materials on agribusiness, agricultural management and mechanics, agricultural science, diseases and pests and horticulture

Instructional Materials Service
Cornell University
24 Roberts Hall
Ithaca, NY 14853-5901
(607) 255-3002
Outstanding Source

- Catalog of resources and instructional materials on agriculture business, farm production and management, ornamental horticulture and agricultural mechanization
- Conservation and Forestry Materials

Instructional Materials Service
Agriculture Education
Texas A & M University
College Station, TX 77843-2588
(409) 845-6001
Outstanding Source

- Agricultural Mechanics
- Greenhouse Management and Operation
- Catalog of materials on agriculture

Instructional Materials Service
Agricultural and Extension Education Department
101 Reifs Hall
University of Florida
Gainesville, FL 32611

- Crop Production Resource Guide
- Horticultural Materials

Kansas Vocational Curriculum
Dissemination Center
Room 116, Willard Hall
Pittsburg State University
Pittsburg, KS 66762-9987
(316) 231-7000

- Horticulture I,II,III
- Vocational Agriculture I,II,III,IV
- Vocational Ag Mechanics

Maryland Vocational Curriculum
Research and Development Center
Department of Industrial Education
University of Maryland
College Park, MD 20742

- Horticulture Nursery Instructional Guide
- Resource Guide to Competency-Based Vocational Education: Agriculture

Mid-America Vocational Curriculum Center
1500 W Seventh Ave
Stillwater, OK 74074-4364
(405) 377-2000

- Employment in Agribusiness
- Microcomputer Applications in Agriculture
- Horticulture Curriculum
- Agricultural Production Curriculum
- Agricultural Mechanics Curriculum

New Mexico State Department of Education
Vocational-Technical Division
Santa Fe, NM 87503

- Horticulture I: A Curriculum Manual

Ohio Agricultural Education
Curriculum Materials Service, Room 254
2120 Fyffe Road
Ohio State University
Columbus, OH 43210-1099
(614) 422-4848
Outstanding Source

Ohio State University
Ohio Career Education and Curriculum
Management Lab in Agricultural
Education
Columbus, OH 43210

Oregon Career Development Consortium
Marion Education Service District
651 High St. NE, Suite 4
Salem, OR 97301

Oregon Department of Education
Division of Vocational Education
700 Pringle Parkway SE
Salem, OR 97310-0290

Pennsylvania Flower Growers
103 Tyson Building
University Park, PA 16802

Superintendent of Public Instruction
Commission for Vocational Education
Old Capitol Bldg
Olympia, WA 98504

Virginia Vocational Curriculum Center
2200 Mountain Rd.
Glen Allen, VA 23060

Vocational Agriculture Service
University of Illinois
1401 S Maryland Dr.
Urbana, IL 61801

Vocational Education Media Center
10 Tillman Hall
Clemson University
Clemson, SC 29631
Excellent Source

- Catalog of slides, software and printed resources on horticulture, natural resources, forestry, agricultural production, agribusiness, and agricultural mechanics.

- Career Preparation in Environmental Protection: A Curriculum Guide
- Catalog of Slides, Software Natural Resources, Forestry, Agricultural Production, Agribusiness, and Agricultural Mechanics.

- Basic Skills in Vocational Education: Computer Skills, Mathematics, Reading, Speaking/Listening and Writing

- Forestry/Forest Products: Subject Matter Update 1986-87
- Individual Learning Systems: Forest Technology, Forest Products

- Bedding Plants: A Penn State Manual
Excellent Reference
Inquire about other titles

- Greenhouse Management
- Nursery Production
- Ornamental Horticulture
- Plant Propagation
- Turf Grass Management
- Vegetable Gardening: A Curriculum Guide to be Used in Conducting Programs for Handicapped Students

- Planning and Implementing a Competency-Based Special Agriculture Program

- Catalog of materials on agricultural business, economics, mechanics, horticulture and plant and soil science

- Agriculture Electricity
- Agriculture Mechanics
- Agriculture Production and Business Management
- Exploring Agriculture
- Gardening and Groundskeeping
- Greenhouse Production
- Small Gasoline Engines
- Tractor Mechanics

**Vocational Occupational Information Center
for Educators (VOICE)**
721 Capitol Mall
Sacramento, CA 95814

Vocational Studies Center
University of Wisconsin-Madison
964 Educational Sciences Bldg.
1025 W Johnson St.
Madison, WI 53706

Associations

**Alaska Natural Resource and Outdoor Education
Association (ANROE)**
Box 110536
Anchorage, AK 99511-0536

Agriculture Council of America
1250 Eye St. NW Suite 601
Washington, DC 20005
(202) 682-9200

The Alaska Federation of Natives (AFN)
411 West Fourth Ave., Suite 301
Anchorage, AK 99501

The Alaska Native Foundation
P.O. Box 100278
Anchorage, AK 99501

Alaska Women in Timber (AWIT)
111 Stedman Street #200
Ketchikan, Alaska 99901

American Association of Nursery Men
230 Southern Building
Washington, D.C. 20005

American Forestry Association
1319 18th St. NW
Washington, D.C. 20036

American Vocational Association
1410 King St.
Alexandria, VA 22314

Brooklyn Botanical Garden Society
1000 Washington Ave
Brooklyn, NY 11225

Communicating for Agriculture
101 E Lincoln Ave
Fergus Falls, MN 56537
(218) 739-3241

- Learning Activity Packets for Vocational Agriculture
- Record Keeping System
- Tools, Equipment and Machinery: Adapted for Vocational Education and the Employment of Handicapped People
- Urban Soil and Water Management

- Flyways, Pathways, Waterways
- Provides networking for natural resources educators, disseminates curriculum trains teachers in curriculum use, and provides and information clearinghouse
- "The Forum Newsletter"
- Provides research and educational materials
- Information on Native land claims
- Information on Native land claims
- Alaska Native Land Claims, by Robert Arnold
- Workbook for Alaska Native Land Claims
- To Have and to Hold Land Resources
- Trouble Ahead
- Alaska's Great Green Forest, an educational program for students in grades 4-6. (Free for Alaska teachers; \$5.00 for out-of-state teachers)
- Organization for ornamental horticulturists.
- Periodical - "American Forests"
- Publisher of seven books
- Instructional materials for agriculture education
- Applying Pesticides
- Brooklyn Botanical Garden Handbooks
- Working for Rural America
- Promotes health, well-being and advancement of people in agriculture and agribusiness.
- Sponsors international agriculture exchange program and presents scholarship awards.

Fertilizer Institute
1015 18th St. NW
Washington, DC 20036
(202) 861-4900

- "Fertilizer Financial Facts"
- "Fertilizer Flash Report"
- "Fertilizer Index"
- "Fertilizer Progress"
- "Our Land and It's Care"

- "Hort-News"
- Maintains library of research and educational materials, designs, general planting, growing information and landscaping catalog

- "Journal of Environmental Horticulture"
- "UPDATE Newsletter"
- Maintains information on sources of plants and supplies. Publishes special research reports, manuals, handbooks, and other information Catalog Available

- Seeds of Success: Biotechnology and Agriculture
- What Is Biotechnology?

- Research in crop management practices and techniques.

Horticulture Awareness Association
14575 Mercury Dr.
Grand Haven, MI 49417
(616) 846-3864

Horticulture Research Institute and American Association of Nurserymen
1250 I Street NW Suite 500
Washington, DC 20005
(202) 789-2900
Excellent

Industrial Biotechnology Association
1625 K St. NW, Suite 1100
Washington, DC 20006

National Alliance of Independent Crop Consultants
949 Turner Quay
Jupiter, FL 33458
(305) 746-3740

Society of American Foresters
5400 Grosvenor Lane
Bethesda, MD 20814

- "Journal of Forestry"
- Up-to-date technical information
- Annual conferences and convention
- Approves forestry programs at postsecondary schools and universities nationwide

Periodicals

Alaska, University of Cooperative Extension Service
The Potting Bench
303 Tanana Dr.
Fairbanks, Alaska 99701

- "Horticulture"

Agricultural & Forestry Experiment Station
School of Agriculture & Land Resources Management
University of Alaska - Fairbanks
Fairbanks, AK 99775-0100

- All areas of Alaskan Agriculture
- "Agroborealis"

Agriculture Education Magazine
RD 2 P.O. Box 639
Halifax, PA 17032

- "Agriculture Education"

American Horticultural Society
P.O. Box 0105
Mount Vernon, VA 22121
(703) 768-5700

- "American Horticulturist"
- North American Horticulture Reference Guide

American Nurseryman Publishing Co.
111 N. Canal St., Suite 545
Chicago, IL 60606
(312) 782-5505

- "American Nurseryman"

American Simmental Association
1 Simmental Way
Bozeman, MT 59715
1-800-548-0205

- Beef teaching aids for classroom or field
Breeder associations are important

American Society of Agricultural Engineers
2950 Niles Road
St. Joseph, MI 49085

- Agricultural Engineering

The Alaska I.P.M. Scout
Cooperative Extension Service
University of Alaska
303 Tanana Dr.
Fairbanks, AK 99701

- Pests & Pest Control

American Society of Agronomy
677 S. Segoe Rd.
Madison, WI 53711
(608) 274-1212

- "Agronomy Journal"
- "Agronomy News"
- Crops and Soils
- "Journal of Agronomic Education"
- "Journal of Environmental Quality"

Floral & Nursery Times
328 Linden Avenue
Wilmette, IL 60091

- "Frticulture"
- "Nursery"

Business Publishers, Inc.
951 Pershing Dr.
Silver Spring, MD 20910-4464

- "Air/Water Pollution Report"
- "Ecology USA"
- "Ground Water Monitor"
- "Hazardous Waste News"
- "Toxic Materials News"

BW Roxburgh
Suite 907 151 Slater St.
Ottawa, Ont. K4 SH4
Canada

- "Agrologist"

Creative Educational Video, Inc.
5147-A 69th Street
Lubbock, Texas 79424
(806) 794-3582

- Broadcast quality specialized agricultural videotapes for improved training

Elsevier Scientific Publications, Co.
52 Vanderbilt Ave.
New York, NY 10017

- "Agriculture and Environment"

Farmers Digest, Inc.
2645 Maple Hill Lane
Brookfield, WI 53005

- "Farm Digest"

Farm Journal, Inc.
230 W Washington Square
Philadelphia, PA 19106

- "Farm Journal"

Future Farmers of America
5632 Mount Vernon Highway
Alexandria, VA 22309-0160

- "The National Future Farmer"

Geo. J. Ball, Inc.
P.O. Box 800
West Chicago, IL 60185

- Grower Talks
- Ball Red Book
Excellent

Horticulture Associates
755 Boylston St.
Boston, MA 02116
(617) 247-4100

- "Horticulture: The Magazine of American Gardening"

Institute for Alternative Agriculture
9200 Edmonston Rd., Suite 117
Greenbelt, MD 20770
(301) 441-8777

- "Alternative Agriculture News"
- "American Journal of Alternative Agriculture"

International Harvester Co.
401 N Michigan Ave.
Chicago, IL 60611

- "IH Forum"

Intertec Publishing Corp.
Box 12910
Overland Park, KS 66212
(913) 888-4664

- "Grounds Maintenance"

Longman Group
Journals Division
43 Annandale St.
Edinburgh EH74AT
Scotland

- "Animal Production"

Meister Publishing Co.
37841 Euclid Ave
Willoughby, OH 44094
(216) 942-2000

- "Ag Consultant and Fieldman"
- "American Fruit Grower"
- "American Vegetable Grower"

Meredith Publications Corp.
1716 Locust St.
Des Moines, IA 50303

- "Farm Computer News"
- "Successful Farming"

Mid-America Publishing Co.
4251 Pennsylvania Ave.
Kansas City, MO 64111

- "Flower and Garden Magazine"
Inexpensive
Easy To Read

National 4-H Council
7100 Connecticut Ave.
Chevy Chase, MD 20815
(301) 656-9000

- "National 4-H News"
- Many 4-H Project Books Contain ideas for SGEP projects & Lab. Activities

National Young Farmer Educational Association
303 Seventh St.
Vandalia, IL 62471
(618) 283-4475

- "National Young Farmer"
- "Young Farmer Update"

The Public Press, Ltd.
1760 Ellice Ave.
Winnipeg, Man. R3H QB6 Canada

- "Country Guide: The Farm Magazine"

Rodale Press
33 E Minor St.
Emmaus, PA 18049
(215) 967-5171

- "Organic Gardening"

Special Books/Pamphlets

Alaska Division of Agriculture
P.O. Box 949
Palmer, AK 99645

- "Alaskan Annual Farm Report"

AgriData Resources, Inc.
330 E. Kilbourne Ave.
Milwaukee, WI 53202
(414) 278-7676

- "AgriData Network:" Agricultural Information and Computing Network

University of Alaska, Fairbanks
Alaska Sea Grant College Program
Attorney's Plaza, Suite 1A
Fairbanks, AK 99775
Contact Sydney Stephens

- "Alaska Sea/River Week Curriculum Guides"
- "The Attached Solar Greenhouse Factsheet"

Conserva, Inc.
401 Oberlin Road, Suite 112
Raleigh, NC 27605

- Handbook for Implementing Improved Vocational Agriculture/Agribusiness Programs in Urban Areas

Cooperative Extension Service
University of Alaska, Fairbanks
303 Tanana Dr.
Fairbanks, AK 99701
(907) 452-1548
Should have all these on reference shelf

- Resources on agriculture and resource development including agricultural, domestic animals and animal products, commercial and farm structures and machinery, land economics, soil water and climatology, pest control, pesticide and fertilizer residues, home gardening, soils and additives, culture pest control and agricultural chemicals, greenhouses, landscaping planning, materials and culture

Doane Information Services
11701 Borman Dr.
St. Louis, MO 63146

- "Farm Management Guide" with Teacher Manual and Student Workbook
Good Reference

E.C. Geiger
Box 285, Rt. 63
Harleysville, PA 19438

- Everything For The Grower Catalog for Commercial Greenhouses

Federal Crop Insurance Corp.
U.S. Department of Agriculture
Washington, D C 20250

- Provides crop insurance for major crops.
Protects against loss caused by natural perils.

Galahad Publishing
5124 S. 3245 W.
Salt Lake City, UT 84118

- "Backyard Vegetable Gardening"

- Garden Way Publishing
Schoolhouse Rd.
Pownal, VT 05261
(802) 823-5811
- "Hints for the Vegetable Gardener"
- Halycon Press of Ithaca
111 Halycon Hill Road
Ithaca, NY 14850
- "Greenhouse Management"
Excellent reference
- Interstate Printers and Publishers, Inc.
P.O. Box 50
Danville, IL 61834-0050
(217) 446-0500
- "Flower and Plant Production in the Greenhouse"
 - "The Greenhouse Growers"
 - "Greenhouse Management for Flower and Plant Management"
 - Western Fertilizer Handbook
 - Many other agricultural publications
- John Muir Publications
P.O. Box 613-BG
Santa Fe, NM 87501
- The Bountiful Solar Greenhouse
 - The Food and Heat Producing Solar Greenhouse
 - Handbook for Greenhouse Gardeners
- Lord and Burnham
Division Burnham Corp.
Irvington-on-Hudson, NY 10533
- National Center for Appropriate Technology
P.O. Box 3838
Butte, MT 59701
- Low-Cost Passive Solar Greenhouses, A Design and Construction Guide
- Ortho Books
Chevron Chemical Company
575 Market St.
San Francisco, CA 94105
- How to Build and Use Greenhouses
 - The Facts of Light About Indoor Gardening
 - Many other excellent books; request catalog.
- Ohio Agricultural Research & Development Center (OARDC).
Research-Extension Analytic Lab
Hayden Hall
Geauga Dr.
Wooster, OH 44691
- Soil Tests
OARDC has many useful bulletins on many areas of agriculture
- Rodale Press
33 E. Minor St.
Emmaus, PA 18049
- The Solar Greenhouse Book
- Running Press
38 S. Nineteenth St.
Philadelphia, PA 19103
- The Handmade Greenhouse from Windowsill to Backyard
- Soil Conservation Service
U.S. Department of Agriculture
Washington, DC 20250
- Provides technical advice to help small farmers find solutions to problems of soil erosion, clean water and barren land that has been surface-mined. Also provides soil surveys to aid in planning farming and conservation actions.
Request catalog of publications

Sunset Books
Lane Publishing Company
Menlo Park, CA 94025

- Greenhouse Gardening
- How to Grow Bulbs
- How to Grow Houseplants
- How to Identify Plants

Swallow Publications
P.O. Drawer 10
Ville Platte, LA 70536
(318) 363-2139

Thomson Publications
P.O. Box 50160
Indianapolis, IN 46250

- Tree, Turf and Ornamental Pesticide Guide

Time-Life Books
Silver Burdett Co.
250 James St.
Morristown, NJ 07960

- Bulbs
- Flowering House Plants
- Lawn and Ground Covers
- Many other titles

U.S. Department of Agriculture
Farmers Home Administration
Washington, DC 20250

- Provides farm loans

U.S. Department of Agriculture
Office of Governmental and Public Affairs
Washington, DC 20250
(202) 447-2791

- Facts sheets, publications and bulletins for all agricultural areas. Request catalog

U.S. Department of Interior
Bureau of Land Management
701 C ST.
Box 13
Anchorage, AK 99513

- Manages public land and leases public land for livestock grazing

Media

Agricultural Education Curriculum
2120 Fyffe Road
Columbus, OH 43210

National Audiovisual Center
8700 Edgeworth Dr.
Capitol Heights, MD 20743-3701

American Angus Assoc.
Materials Service
3201 Frederick Blvd. (good films)
St. Joseph, MO 64501

National Innovative Media Co.
Route #2, Box 301 B
Calhoun, KY 42327

American Association for Vocational
Instructional Materials (AAVIM)
120 Driftmeir Engineering Center
Athens, GA 30602

Pictures, Inc.
811 W. 8th Ave.
Anchorage, AK 99501-3495

Instructional Materials Service
Cornell University, 24 Robert Hall
Ithaca, NY 14853-5901

American Quarter Horse Assoc.
P.O. Box 200
Amarillo, TX 79168
Good films

Prentice-Hall Media
150 White Plains Rd
Tarrytown, NY 10591

Brodhead-Garrett Co.
4560 E. 71st St.
Cleveland, OH 44105

Simulators, Inc.
1366-70 Ruan St.
Philadelphia, PA 19124

Career Aids, Inc.
20417 Nordhoff St.
Chatsworth, CA 91311

Computer Software Resources
AAVIM
120 Driftmier Engineering Center
Athens, GA 30602

Crc./Data Management Systems
1521 Birte House Road, Suite B
Yuba City, CA 95991

The Farm Film Foundation
Suite 424 Southern Bldg.
1425 H St. NW
Washington, DC 20005

Modern Talking Picture Service, Inc.
5000 Park St. N
St. Petersburg, FL 33709
Outstanding source of films,
Free Loan Service

Toro Irrigation Division
5825 Jasmine St.
Riverside, CA 92504

Teaching Aids, Inc.
P.O. Box 1798
Costa Mesa, CA 92628-0798

Venard Films, Ltd.
Box 1332
Perioa, IL 61654

Vocational Education Media Center
10 Tillman Hall
Clemson University
Clemson, SC 29631

Vocational Education Productions
Cal Poly State University
San Luis Obispo, CA 93407

Materials Suppliers

Alaska, University of Cooperative Extension
University of Alaska
Fairbanks, AK 99775-5200

Seeds J. Ball, Inc.
P.O. Box 335
West Chicago, IL 60185

Wilson Greenhouse, Inc.
100 Wilson Rd.
Lakeland, FL 32210

Burpee Gardens Agricultural
Warminster, PA 18974

Carolina Biological Supply Company
2700 York Road
Burlington, North Carolina 27215

Chevron Chemical Co.
Ortho Consumer Affairs - Ortho Films
P.O. Box 7144
San Francisco, CA
Excellent free films

Larry Connor, PhD
Beekeeping Education Service
P.O. Box 817L
Cheshire, Connecticut 06410-0817

A.H. Hummert Seed Co.
2746 Chouteau Avenue
St. Louis, Missouri 63103
Attn: Order Department

Indoor Garden Supplies
P.O. Box 40567
Detroit, MI 48240
Lamotte Chemical Products, Co.
P.O. Box 329
Chestertown, MD 21620

J.M McConkey and Co. Inc.
P.O. Box 309
Sumner, WA 983909-0309
Greenhouse supplies

Mellingers, Inc.
2310 W. South Range Road
North Lima, OH 44452-9731

NASCO West
1524 Princeton Avenue
Modesto, CA 95352
Supplies and book for everything in Ag.

Northern Hydraulics, Inc.
P.O. Box 1499
Burnsville, MN 55337

Cornell Instructional Materials Service
Daryle Foster, Director
Cornell University
Ithaca, NY 14850

Florists Publishing Company
310 South Michigan Avenue
Chicago, IL 50504

E.C. Geiger
Box 285 rt. 63
Harleysville, PA 19438
Greenhouse supplies

Goldblatt Tool Co.
511 Osage
Kansas City, KS 66110

Park Seed Co.
Cokesbury Road
Greenwood, SC 29647-0001

Satco, Division of Saterlee
924 S. 19th Ave.
Minneapolis, MN 55404

Scavengers Science Education Supplies
P.O. Box 211328
Auke Bay, AK 99802
A "must" for anyone teaching Nat Res

Technovate, Inc.
910 SW 12th Ave
Pompano Beach, FL 33060

Turner Equipment Co., Inc.
Hwy 117 South
Goldsboro, NC 27530

SUGGESTED RESOURCES BY UNIT

Leadership, SOEP, COOP, and OJT

Future Farmers of America
Box 15160
Alexandria, VA 22309

- FFA Advisor's Handbook
- Chapter Guide to FFA Activities
- Proficiency Awards
- International Study Opportunities (WEA)
- What is FFA? (Pamphlet)
- Leaders for the New Fields of Agriculture (Pamphlet)
- Official FFA Manual 1980 Vocational FFA Agriculture
- SOEP Record & Record Summary Package
- FFA & Vo AG Record Summary and Analysis
- SOEP Enterprise & Record Book
- SOEP Sample Program & Key
Apple II series computers
- Parliamentary Procedure & FFA Review, (Hobar), Apple II series computers, TRS II, III,4
- Basic Lesson for Parliamentary Procedure Instruction. Complete lesson plans 63 page loose-leaf manual
- Supervised Occupational Experience (SOE) Programs Manual
- Leveling & Land Measurement Practices for AG. Two-manual series-Student Activity Manual and Instructor's Reference Manual
- Minnesota Vo AG Enterprises , A computer Record-keeping package for Minnesota SOE Programs, Apple II series computers or Apple III in II emulation-

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

The Department of Agricultural Education
Iowa State University
Ames, Iowa
For beginning Vocational Agriculture Students

- Iowa Vo AG Enterprises; A computer record keeping package for Iowa SOE Programs Apple II series computers.

- An Instructional Packet on Leadership/FFA

Natural Resources

Arctic Environmental information and Data Center
(A.E.I.D.C.)
Anchorage, AK

- Use of the Sea by Alaska Natives--A Historical Perspective.

Alaska Center for the Environment
700 H St. #4
Anchorage, AK 99501

- Environmental group. Deals with hazardous wastes.

Alaska, University of--Fairbanks
School of Agriculture-Land Resources
Management
301 O'Neill Resources Building
Fairbanks, AK 99775-0100

- State FFA Center ; Handbook, Bibliography of Forest, material, Who's Planning Alaska, Instructional materials on Alaska Gardening and Root Cellaring

Available thru:
UAF library (and probably other libraries around the state)

- Natural Resources Management
Includes units on:
Regional Corporations
Maps: Tools of Resource Managers
Subsistence Resources Issues
Land-Wildlife Resources
Forest Resources
Fisheries Resources
Water Resources
Energy Resources
Tourism Resources

Also:
Alaska Native Education
P.O. Box 1250
Fairbanks, AK 99707

*A self-paced introduction of Alaska native students focusing on regional corporation responsibilities.
Computerized. (Commodore)*

Alaska SEA Grant College Program
University of Alaska-Fairbanks
UAF-Fairbanks, 99701

- Alaska SEA Week Curriculum Series

Excellent source of activities. Several different guides are available.

Alaska State Film Library
650 W. International Airport Road
Anchorage, AK 99815

- Videos on ANSCA: "Common Ground", "Losing Ground", "The Struggle", "ANCSA Plain and Simple", "Beyond the Bottom Line", "ANCSA-Land at Risk"

California Polytechnic State University
Vocational Education Production
San Luis Obispo, California 93407

- Natural Resources Curriculum Guidelines

The Conservation Foundation
1255 Twenty-Third Street, NW
Washington, DC 20037

- National conservation organization

Freeman and Co., W.H.
660 Market St.
San Francisco, CA 94104

- Resources and Man, 1969

Minnesota Instructional Materials Center
3554 White Bear Ave.
White Bear Lake, MN 55110
(616) 770-3943

- Natural Resource Management

National Environmental Education Development
Silver Burdett & Ginn Inc.
Div. of Simon & Schuster
191 Spring St.
Lexington, MA 02173

- Adventure in Environment

National Farm Book Company
P.O. Box 206 - 5149 Highway T.
Wisconsin 54406
(715) 824-5445

- Conservation & Management of Natural Resources in the U.S. (College Amherst, Text)
- Investigations In Conservation of Natural Resources

Rhode Island Department of Elementary and Secondary Education
22 Hayes Street
Providence, RI 02908

- Natural Resource Curriculum Guide

University Publishers Inc.
239 Park Avenue South
New York, NY 10003

- The Land Resources of Alaska, by Johnson, Hugh A. & Jorgenson, Hugh A

U.S. Department of Agriculture
Yearbook of Agriculture (Free)
Available from member of congress--only by request.

- Using our Natural Resources

U.S. Government Printing Office
Superintendent of Documents
Washington, D.C. 20402

- "Investigating your Environment",
Stock No. 001-001-00446-4

• Career Education in the Environment

The latter is an extensive reference. Contains 110 pages on environmental careers, 156 pages of an environmental education curriculum, and 55 pages of bibliography for environmental science.

Washington, Univ. of, Press
P.O. Box 50096
Seattle, WA 98105

- Indian Fishing: Early Methods on the Northwest Coast

John Wiley and Sons
605 Third Ave.
New York, NY 10016
(212) 207-7099

- Conservation and Management of Natural Resources in the U.S.
A good natural resources text for high schools

Agricultural Mechanics

American Technical Publishers
1155 W. 175th St.
Homewood, IL 60430

- Welding Skills
- Welding Fundamentals
- Welding Technology

**Arizona, University of
Department of Agriculture Education
Tucson, AZ 85721.**

- Agricultural Mechanics

**American Association for Vocational
Instructional Materials
120 Engineering Center
Athens, GA 30602
Excellent Source for Ag. Mechanics**

- Ag Mechanics Curriculum
- Catalog of materials

**California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407**

- Great source of resources ranging from ag mechanics to "use of surveying level kit."

**CIMC
1500 West Seventh
Stillwater, Oklahoma 74074-4364**

- Agricultural Mechanics
- Agricultural Mechanics Shop Project Plans

**F.M.O by John Deere
John Deere Rd.
Moline, IL 61265
(309) 752-8000**

- Mostly tractor material

**Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293**

- Shopwork on the Farm

**Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170**

- A must for ag mechanics teachers. Includes comprehensive series of Apple II-series software on all aspects of ag mechanics--including construction and maintenance. Write for catalog.

**Texas A and M University
Vocational Instruction Service
F.E. Box 2588
College Station, Texas 77843-2588
(409) 845-6601.**

- Student Materials

Animal Science

**American Society for Prevention of
Cruelty to Animals (ASPCA)
441 E. 92nd St.
NY, NY 10028**

- America's first Humane Society

**CIMC
1500 West Seventh
Stillwater, OK 74074-4364**

- Agriculture Livestock Skills
- Techniques of Judging Dairy Cattle

**Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170**

- Extensive resources in animal science. Lots of resources in dairy, cutting meat, raising farm animals. Includes slides, cassettes, videos, and Apple II software.

Instructional Materials Service
Texas A & M University
F.E. Box 2588
College Station, Texas 77843-2588
(409) 845-6601

Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93407

Plant Science

Maryland, University of
Botany Dept.
College Park, MD 20740

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

Michigan State University
Plant Science Dept.
East Lansing, Michigan 48824

Mississippi State University
Curriculum Coordinating Unit
Drawer DX
Mississippi State, MS 39762

Soil Science/Agronomy

CIMC
1500 West Seventh
Stillwater, Oklahoma 74074-4364

Cooperative Extension Service
University of Alaska - Fairbanks
303 Tanana Dr.
Fairbanks, AK 99701

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

Illinois, Southern Univ. at Carbondale
Dept. Of Agricultural Education
and Mechanization
Carbondale, IL 62901

Instructional Materials Service
F.E. Box 2588
Texas A & M University
College Station, Texas 77843-2588
(409) 845-6601

- Numerous publications on animal science. Specifically, sheep, swine, cattle, poultry. Includes videos and software. Write for catalog.

- Publications ranging from beef production to buying a horse.

- "Methods In Plant Tissue Culture"

- Working in Plant Science

- Demonstrations in Ornamental Horticulture and Plant Science

- Basic Principles of Plant Science

- Materials in voc. agriculture and farm business management.

- "Soil Fertility For Home Garden and Greenhouse"

- Great references in soil science. Resources on farm management. Considerable Apple I software on same. Materials applicable to some other natural resources -agriculture fields.

- "Soils and Fertilizers" (Lesson Plans)
- "Greenhouse Soils" (Lesson Plans)

- Materials in voc. agriculture. Includes color slide programs. A good place for FFA materials. Pre-employment competencies. Also materials for special needs students.

Midwest Library Service
11443 St. Charles Rock Road
Bridgeton, MO 63044

- "Profitable Farming Now"

National FFA Center
5632 Mt. Vernon Memorial Highway
P.O. Box 15160
Alexandria, VA 22309-0160

- Agriculture Audio/Visuals

Soil Conservation Service
U.S. Dept. of Agriculture
209 E. 9th Ave., Suite 300
Anchorage, AK 99501-3687

- America's Soil and Water: Condition and Trends; Good full color reference.
- Conserving Soil; Excellent book: Contains numerous ready to copy teaching masters.

Soil Conservation Society of America
7515 NE Ankeny Road
Ankeny, IA 50021

- Journal of Soil and Water Conservation

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602

- Varied resources. From "Farming and the computer to "Solar Livestock Housing Handbook."

Vocational Education Productions
California Polytechnic State University
San Luis Obispo, California 93407

- Many soil science/agronomy publications.
Ag ledger software, other ag software and videos.

Horticulture

Ornamental Horticulture

American Association of Nurserymen
230 Southern Building
Washington, D.C. 20005

- American Standard For Nursery Stock

This Organization has many excellent publications. Every teacher should have a copy of their free publications list.

American Association For Vocational Instructional Materials
Engineering Center
Athens, GA 30602

- Applying Pesticides (Student Manual and Workbook and Teacher Guide)

California, University of Agricultural Extension

- "Fertilizer and Irrigation for Plants on Retail Display"
- "Soils"

Chevron Chemical Co. - Ortho Division
Public Relations
575 Market St.
San Francisco, CA 94105

- "Trees For a More Livable Environment" (Free-They have many other materials)

Clemson University Cooperative Extension Service
Clemson, SC 29631

- "Insects and Diseases of Ornamentals: How to Control Them"
Outstanding color photos of various pests.

Cornell Univ. Instructional Materials Service
Ithaca, NY 14850

- Innovative Teaching Ideas, Volume I and Volume II

Excellent ready to copy exercises for all areas of agriculture.

Crop Science Society of America
Division C-5, Turfgrass
677 South Segoe Road.
Madison, WI 53711
Outstanding!

John Deere Co.
John Deere Rd.
Moline, IL 61265
(309) 752-8000

Diamond Shamrock Agricultural Chemicals Division
617 Veterans Blvd.
Redwood City, CA 94063
excellent 5 pp. Color Booklet

Environmental Design Press
P.O. Box 2187
Reston, VA 22090

Environmental Protection Agency
Washington, D.C. 20460

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

Illinois, Univ. of, at Urbana-Champaign
College of Agriculture
Cooperative Extension Service
Urbana, IL 61801

Interstate Printers and Publishers, Inc.
P.O. Box 50
Danville, IL 61834-0050

Kentucky, University of
Dept. of Vocational Education
College of Education
Instructional Materials Laboratory
Lexington, KY 40506

Michigan State University
Cooperative Extension Service
East Lansing, MI 48824
Excellent, easy to read.

National Center For Research In Vocational
Education
Ohio State University
1969 Kenny Road
Columbus, OH 43210

- "Diseases of Turfgrass" (Slide Set and Full-color Script)
- "Lawn and Garden Safety Savvy" (Free) *Excellent! Cartoon format-Kids love it!*
- "Weed and Disease Control In Turf and Ornamentals"
- "Business Management Techniques For Nurserymen"
- **Apply Pesticides Correctly: A Guide For Commercial Applicators**
Excellent, easy to read.
- Hobar has innumerable publications in this area.
- "Designing an Energy-Efficient Home Landscape" (Circular 1178)
Should be particularly useful to Alaska landscapes.
- 50 Laboratory Exercises For Vocational Ornamental Horticulture
- "Various Horticulture Units" (Modules)
- Glasshouse Ornamental Disease Control Handbook
- Safe Effective Use of Pesticides: A Manual for Private Applicators Extension Bulletin E-1025
- Horticulture and Agricultural Mechanics Resource Guide for Vocational Education with Microfiche Samples

National Farm Book Company
P.O. Box 206 - 5149 Highway T.
Amherst, Wisconsin 54406
(715) 824-5445

- Ornamental Horticulture: Principles & Practices
- Greenhouse Operation & Management
- How to Build Greenhouses
- Gardener's Solar Greenhouse

North Carolina State Univ.
Dept. of Plant Pathology
Available from Cooperative Extension Service
Raleigh, NC 27650

- "Sick Plants... Why?" (Cir. 576)
Extremely well illustrated booklet, easy to read: A "Must."

North Central Regional Extension
Available from:
Indiana Cooperative Extension Office
Purdue University
Lafayette, IN 47907
or:
Illinois Cooperative Extension Office
110 Mumford Hall
Univ. of Illinois
Urbana, IL 61801

- Publication No. 26 Outstanding full-color bulletin. Must have!

Ohio Agricultural Research and
Development Center
Wooster, Ohio 44691

- "Insect and Mite Pests of Trees and Shrubs" (Research Bull. 983)

Ohio State University
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, OH 43210

- The Nursery Worker
(Student Manual and Teacher's Guide)
Good teacher's guide

O.M. Scotts Co.
Marysville, OH 43040

- Information Manual For Lawns and Gardens
Excellent 146 pp. reference
- "What's That Weed?"
Excellent full color booklet--free.

Pennsylvania State University
College of Agriculture
Agricultural Experiment Station
Dept. of Agricultural Education
University Park, PA

- Numerous publications in the area of landscape, turfgrass, pests, and more. Excellent source.

Play Inc.
314 Orenda Rd.
Bramalea, Ontario
Canada L6T 1G1

- Plantex Fertilizer Guide for Horticulture and Agriculture

Pro-Lawn Service
P.O. Box 9864
Columbus, OH 43202

- "Pro-Lawn Service Accounting"
- "Application For a Service Business"
Good for a student with a lawn service SOEF

Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

- Working in Horticulture
Good basic text with workbook

Ratcliff, Bargyla and Cyler
Prairie Valley, CA 92061

- Seaweed in Agriculture and Horticulture
Great section on soils and growing media

Texas A and M Univ
Vocational Instructional Service
College Station, TX 77843

- "Propagating Horticultural Plants"
Excellent, very complete.
- A Suggested Outline For A High School
Ornamental Horticulture Curriculum
- Several publications regarding landscaping trees and
shrubs.
- Innumerable resources in ornamental horticulture.
Write for catalog.
- Mowing and Spraying Equipment

Vocational Education Productions
California Polytechnic State Univ
San Luis Obispo, CA 93407

U.S. Forest Service
Institute of Northern Forestry
Fairbanks, AK 99775-5500

Vocational Education Productions
California State Polytechnic College
San Luis Obispo, CA 93401

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602

Floriculture

American Can Company
Floral Products Division
Neenah, WI 54956
Excellent brochures

Illinois, University of, at Urbana/Champaign
Cooperative Extension Service
Urbana, IL 61801

Michigan State University
Cooperative Extension Service
East Lansing, MI 48824

Ohio State University
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, Ohio 43210

Ohio State Univ.
Instructional Materials Laboratory
College of Education
1885 Neil Avenue, Room 112
Columbus, OH 43210

Pennsylvania State University
College of Agriculture
Agricultural Experiment Station
Dept. of Agricultural Education
University Park, PA

Small Business Administration
1441 L St. NW
Washington, DC 20416

- "Floral Design Pointers"
(A series of leaflets - **FREE**)
- "Flower Arranging" (Cir. 1020)
- "Terrariums: Construction & Maintenance" (Cir. 1086)
- "Pruning Evergreens & Deciduous Trees & Shrubs" (Circular 1033)
- "Flower Arranging" (Extension Bull. 410)
The Best!! Must have! Widely used as a text in floral design.
- **Retail Floriculture Book 1 & 2**
Numerous slide sets
- Task/Activity Analysis for Horticulture
- An Analysis of the Retail Florist Occupation
- An Analysis of the Wholesale Florist Occupation
- **Retail Flower Shop Operation & Management** (Student Manual & Teacher Guide)
- Starting & Managing A Retail Flower Shop
Excellent book. 121 pp.

Greenhouses

ACME Engineering & Manufacturing Corp.
Muskegee, OK 74401

Alaska, University of-Anchorage
Cooperative Extension Service
Wayne Vandre, Horticulture Specialist
Anchorage, AK 99504

Alaska, Univ. of -Fairbanks
Cooperative Extension Service
University of Alaska - 303 Tanana Dr.
Fairbanks, AK 99701

Alberta Public Affairs Bureau
Publication Services
11510 Kingsway Avenue
Edmonton, Alberta Canada T5G-2Y5

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

Cornell University
Cooperative Extension Service
7 Research Park
Ithaca, NY 14850

Easi-Build Pattern Co., Inc.
Briarcliff Manor, NY 10516

Florida Dept. of Education
Career Education Center
415 N. Monroe St
Tallahassee, FL 32306

FTD (Florists Transworld Delivery Service)
P.O. Box 2227
Southfield, MI 48037

Georgia, University of
Division of Vocational Education College of Education
Athens, GA 30602

The Hyponex Company, Inc.
Copley, Ohio 44321
Excellent full color booklet - 35 pp.

Illinois, Southern, Univ of
Dept. of Agricultural Education & Mechanization
Carbondale, IL 62901

- The Greenhouse Climate Control Handbook
- Proceedings of the Alaska Greenhouse Conferences
The most up-to-date information available on the Alaska greenhouse industry:

- A Key To Flower Growing In Alaska
- "Greenhouses in Alaska"

- "Biological Pest Management For Interior Planescapes"
Good booklet
- Extensive list of publications in ornamental horticulture. Write for catalog.
- Cornell has many excellent horticultural references, especially in the area of greenhouses.
- "Nutrition of Greenhouse Crops"
Outstanding booklet. Should be on every reference shelf.
- "How to Build a Walk-In or Window Greenhouse"
- Floriculture (Lesson Planning Manual)
- Floriculture (A catalog of Performance Objectives,
- Criterion-Referenced Measures & Performance Guides
- "Caring for Indoor Flowers & Plants"
*Excellent full color booklet (33 pp.)
Obtain through local FTD florist*
- Introduction to Horticulture
- "Houseplants: All the Basics You Need Know"
- Controlling the Greenhouse Environment Agricultural Lesson Plans

- Jiffy-Pot Company of America
West Chicago, IL 60185
48-page illustrated reference (free) provide valuable information on bedding plant production
- "All About Jiffy-Pots" (Bulletin #100)
- Kentucky, University of
Dept. of Agricultural Engineering
College of Agriculture
Lexington, KY 40506
A series of in-depth bulletins covering all phases of greenhouse environmental control and greenhouse construction
- "Complete Greenhouse Series"
- Ohio Florists' Association
Office of the Executive Secretary
Harry K. Tayama
2001 Fyffe Court
Columbus, Ohio 43210
Excellent quick references - should be posted on or near every pesticide storage cabinet
- Wall Charts Covering:
Insect & Mite Control
Growth Regulators
Disease Control
- Ohio Agricultural Research &
Development Center
U.S. Rt. 250 and Ohio 835
Wooster, OH
- An Economic Evaluation of Energy
Conservation
• Investments for Greenhouses
- Ohio State University
Cooperative Extension Service
2120 Fyffe Road
Columbus, Ohio 43210
- Catalog (Frue) "Buckeye Publications"
• "The Greenhouse Worker" (Student
Manual & Teacher Guide). Good teacher's guide
Other varied references available. Excellent source.
- Penn State Industrial Resources & Innovation
225 Pond Lab
University Park, PA 16802
- Greenhouse Energy Conservation.
• Greenhouse Crop Production (Student College of
Manual & Teacher's Guide)
- Purdue University
Cooperative Extension Service
West Lafayette, IN 47907
Excellent resource
- "Plants for Indoors" (Bulletin H0-56)
• "Unusual House Plants" (Bulletin 36)
- Reston Publishing Company, Inc.
Reston, Virginia 22090
- Greenhouse Operation and Management
Advanced
• "Plants to Beautify The Home"
- River Farm Corporation
c/o The American Horticultural Society
Mt. Vernon, VA 22121
This is a retail catalog, but it contains excellent color photos of house plants horticulture students must learn.
- Texas A&M Agricultural Education,
Teaching Materials Center
Texas A&M University
College Station, TX 77843
- Pre-employment Training in
Greenhouse Operation
Resource Material For Lesson Plans in
Greenhouses
- Wisconsin, Univ. of
Bureau For Career & Manpower Development
State Dept. of Public Instruction
Platteville, Wisconsin
- Ornamental Horticulture, Greenhouse
Management
- Vocational Education Media Center
Clemson University
Clemson, SC 29631
- Greenhouse Production
• Floriculture

Vocational Resources
120 Driftmier Engineering Center
Athens, GA 30602

- Greenhouse Crop Production
- Greenhouse Gardening
- Greenskeeping
- Planting
- Tillage
- Other varied resources as well.

Vegetable and Fruit Production (Olericulture)

Alaska, University of
School of Agriculture and Land Resources
Management
Agriculture and Forestry Experiment Station
Fairbanks, AK 99775

American Greenhouse Vegetable Growers
Association
Box 20228
Columbus, OH 43220
(614) 454-1498

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

- Cold Climate Gardening and Root Cellaring in Alaska: An Instructional Guide, Ag. Ed. Pub. #3
This curriculum guide is a must for gardening instructors.
- Annual reports of variety trials
- "Greenhouse Grower" Magazine
- Shares information with growers and suppliers
- One of the largest, most standard publishers of Vocational Ed
- Extensive resources in this area. Write for catalog.

Many of the sources named in previous areas also have resources in olericulture.

Land, Air, and Water

Environmental Film Service
P.O. Box 776
408 East Main St.
League City, TX 77573

Hobar Publications
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170

U.S. Army Corps of Engineers
Alaska District
P.O. Box 898
Anchorage, AK 99506-0898
(907) 753-2712
(800) 478-2712

- "For Generations to Come"
Highlights the USDA Soil Conservation Service.
- Soils/ land application-environmental protection resources as well as cassettes/slides. Information on surveying, land management, and natural resources. Also has information on water resources. Write for extensive catalog.

- "Development in Alaska's Waterways and Wetlands"
- "Water Resources Development in Alaska"

Forestry

A & W Publishers, Inc.
95 Madison Avenue
New York, NY 10016

Alaska, all libraries

- The Forest World: The Ecology of the Temperate Woodlands
- North American Forest Lands at Latitudes North of 60 Degrees

Nongame Program
ADF&G
333 Raspberry Rd.
Anchorage, AK 99512

Alaskan Women in Timber (AWIT)
111 Steadman Street #200
Ketchikan, Alaska 99901

American Forestry Association
1319 18th Street, N.W.
Washington, D.C. 20036

The American Forest Foundation
1619 Massachusetts Avenue, N.W.
Washington, D.C. 20036

American Heritage Press
A subsidiary of McGraw-Hill
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293

American Paper Institute
260 Madison Avenue
New York, NY 10016

American Wood Council
1619 Massachusetts Avenue, N.W.
Washington, D.C. 20036

Barnes, A.S., and Company

British Columbia, University of
Western Education Development Group
Vancouver, B.C. V6T 1W5

British Columbia Worker's Compensation Board
5255 Heather Street
Vancouver, B.C. V5Z 3L8

California Office of Procurement Publications Section
P.O. Box 20191
Sacramento, CA 95820

California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407

Canadian Pulp and Paper Association
San Life Building
Montreal, Quebec, Canada

- Alaska Wildlife Week: Unit: "Alaska's Forests... More than Just Trees"

- Alaska's Great Green Forest
Free(Alaska Teachers) \$5.00(Out of state)
- The Forest Book.
- Woodlands for Profit and Pleasure
Inside Wood
- Famous and Historic Trees
- Ways of the Woods: A Guide to the Skills and Spirit of the Woodland Experience
- Knowing Your Trees
- "American Forests" Magazine
- "The American Tree Farmer" Magazine

- The Secret Life of the Forest

- "How You Can Make Paper?" (Pamphlet)

- Some Little Known Facts About Wood

- Ecology and Our Forests
- "Forest Nursery Studies"
- "Seeing Through the Trees"
- The Stump Book
- Managing the Forest

- "Fallers' and Buckers' Handbook
This is an excellent student text.

- California Forestry Handbook

- A number of excellent resources in forestry, including slides and other audio-visuals.

- The Forest Harvest (Free)

- Control Data**
Agricultural Products and Services
2001 Killebrew Dr., Suite 333
Bloomington, MN 55420
- "Videotapes and Videodiscs for Agricultural Education"
- Cornell University**
Cooperative Extension Services of the Northeast States
Cooperative Extension Service
Ithaca, NY 14853
- 4-H Forestry Handbook and Leader's Guide
Excellent for beginning course.
 - Burning Wood
- Forest Farmers Association**
Suite 380
4 Executive Park East, N.E.
Atlanta, Georgia 30347
- "Forest Farmer" Magazine
- Forest Industries Council**
American Forest Institute
1619 Massachusetts Avenue, N.W.
Washington, D.C. 20036
- "Greenamerica" Magazine
- Forestry Farmers of Minnesota, Inc.**
P.O. Box 363
Park Rapids, Minnesota 56470
- "Forest Management Digest"
- Forestry AGDEX 300**
- "Classroom Demonstrations of Wood Properties" Agdex 300
 - "Management of Forest Resources for Multiple Use," Agdex 300/10
 - "Falling and Bucking Timber with Safety and Profit," PNW 11. Agdex 300/55.
- Forest Products Accident Prevention Association**
P.O. Box 270
North Bay, Ontario, Canada P1B 8H2
Phone: (705) 472-4120
- "Film and Video Cassette Catalog"
Lists dozens of media items. Rental fee is \$10.00 per film.
- 4-H National Council**
7100 Connecticut Avenue
Washington, D.C. 20015
- "What's a Tree to Me?"
- Freeman, Miller**
500 Howard Street
San Francisco, CA 94105
- Logging Practices: Principles of Timber Harvesting Systems
 - Timber Cutting Practices
 - "Forest Industries" Magazine
- Harper and Row Publishers, Inc.**
10 East 53rd Street
New York, NY 10022
(212) 207-7099
- The Living Forest
- Hatton, Brown and Co., Inc.**
Box 2286
485 South Lawrence Street
Montgomery, Alabama 36103
- Loggin' Times
 - Pulpwood Production and Timber Harvesting
- Idaho, University of**
Cooperative Extension Service
Moscow, Idaho 83843
- "Safe Chain Saw Operation" Bull. 599.

**Idaho, University of
Cooperative Extension Service
College of Agriculture
Moscow, Idaho 83843**

- "Safe Chain Saw Operation" Bull. 599

**Interstate Printers and Publishers
P.O. Box 50
Danville, Illinois 61834-0050**

- Forests and Forestry
- Forestry Curriculum Guide
- Pulpwood Production, 34th edition
- Chain Saw Manual

**Kentucky, University of
College of Agriculture
Cooperative Extension Service
Lexington, KY 40506**

- "Measuring Farm Timber" (Bull #FOR-9)
- "Obtaining, Seasoning and
Burning Wood" (Bull. #AEES-18)

**Macmillan Publishing Company
866 Third Avenue
New York, NY 10022**

• Reading the Woods

**Gregg Division/McGraw-Hill Book Co.
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293**

- Forestry and its Career Opportunities
- Forest Fire Control and Use
- Principles of Silviculture
- Forest Management: Regulation and
Valuation
- Forest Products
- Introduction to Forestry

**Meadows, Ben, Company
2601-B West 5th Avenue
P.O. Box 2781
Eugene, Oregon**

• Log Scaling and Timber Cruising

**Michigan State University
Cooperative Extension Service
1 Morrill Hall
East Lansing, Michigan 48824**

- Forestry Terms (Bulletin E-1238)
- "Forestry Programs for
Programmable Calculators"

**Milliken Publishing Company
1100 Research Blvd., P.O. Box 21579
St. Louis, MO 63132-0579**

- Woodworking: Trees, Wood in
the Woodworking Industry

**Minnesota, University of
Agricultural Extension Service
Minneapolis, MN 55455**

- "Safe Operation of Logging
Equipment" Folder 628)

**National Woodlands Magazine,
P.O. Box 584
Traverse City, Michigan 49684**

• "National Woodlands Magazine"

**Nature Study Guide Publishers
Box 972
Berkeley, CA 94701**

- Master Tree Finder: A Manual For the
Identification of Trees by Their Leaves
- Catalog of other books

**Northern Logger and Timber Processor
P.O. Box 69
Old Forge, NY 13420**

- "The Northern Logger and Timber
Processor" Magazine

- Ohio State University**
Agricultural Education Curriculum Materials Service
2120 Fyffe Road
Columbus, Ohio 43210
- "Timber Cruising" (Slide Set)
 - Hardwood Lumber Scaling (Slide Set)
- Prentice-Hall**
ServCode ZQ
150 White Plains Road
Tarrytown, NY 10581
- Elementary Forestry
 - "The Deciduous Forest" (Filmstrip)
- Project Learning Tree**
P.O. Box 129
Tiburon, CA 94920
- Also:**
American Forest Council
1250 Connecticut Ave., NW
Washington, DC 20036
- Project Learning Tree
For workshops in your area contact Alaska Department of Fish and Game
- Purdue University**
Dept. of Forestry and Natural Resources
Agricultural Experiment Station
West Lafayette, IN 47907
- "A Method For Ecological Forest Sampling"
- Reedley College**
Reedley, CA 93704
- Mathematics for Natural Resources Technicians
- Reinhold Company**
135 West 50th Street
New York, NY 10020
- Paper Basics: Forestry, Manufacture, Selection, Purchasing, Mathematics and Metrics, Recycling
- Ronald Press**
P.O. Box 447
St. Louis, MO 63166
- Logging and Pulpwood Products
 - Forest Ecology
 - Essentials of Forestry Practice
 - Wildland Watershed Management
- Southern Forest Products Association**
P.O. Box 52468
New Orleans, LA 70152
- Trees Forever: An Environmental Challenge
 - Our Forests (Booklets and Teacher's Manual)
- Stephen Greene Press**
Brattleboro, Vermont 05301
- One Man's Forest: Pleasure and Profit from Your Own Woods
- Society of American Foresters**
5400 Grosvenor Lane
Washington, D.C. 20014
- Forest Cover Types of the United States and Canada
 - Choices in Silviculture for American Forests
- St. Regis**
150 East 42nd Street
New York, NY 10017
- The Life of the Forest
Outstanding full color booklet. Every student should have a copy. At one time, these were available at no cost.
- Syracuse University Press**
New York, NY 13210
- Woodland Ecology: Environmental Forestry For the Small Owner
- Vance Publishing Corporation**
300 W. Adams
Chicago, Illinois 60606
- "Wood and Wood Products" Magazine

Virginia Agricultural Education Service
Div of Voc Ed, State Department of Education
Richmond, Virginia 23216

- "Forestry in Agricultural Education"

Wisconsin, University of
Department of Wildlife Ecology
Cooperative Extension Programs
Madison, Wisconsin 53706

- Extension Service Literature on wildlife, freshwater fishing and forestry

U.S. Forest Service, Alaska Region
Federal Office Building
Box 1628
Juneau, Alaska 99802

- "Alaska's Birch," Alaskan Woods, Series No. 2
- Alaska's Spruce: Sitka Spruce and White Spruce, "Alaskan Woods" Series No. 2
- "Silvicultural Systems for the Major Forest Types of the U.S." Agricultural Handbook Number 445
- Insects and Diseases of Alaskan Forests, Report Number 181, Rev. 10/85
- How A Tree Grows
Many other publications
- "Intermediate Fire Behavior"

U.S. Forest Service
Pacific NW Forest and Rngr Exp. Station
P.O. Box 3141,
Portland, OR 97208

- Glossary of Forest Engineering Terms

U.S. Government
Government Printing Office
Washington, D.C. 20402

- "Introduction to the Fundamentals of Fire Behavior: A Programmer's Learning Tool"
- "Fire Weather: A Guide for Application of Meteorological Information to Forest Fire Control Operations"
- "Fire Management Notes" Magazine
- American Forest Policy in Development

Washington, University of Press
P.O. Box 50096
Seattle, Washington 98105

- Elementary Timber Measurements

Willey, John & Sons.
605 Third Ave.
New York, NY 10016
(212) 207-7099

- Forest Mensuration
- The Practice of Silviculture
- Introduction to Forest Science

Fishing & Fisheries

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, AK 99802
(907) 465-4112

- Provides free information, training and inspections
- Alaska Sport Fish Identification Handbook
- Game Fishes of Alaska
- Wildlife Notebook Series & Teacher's Guide
- "Alaska Fisherman's Journal" Magazine

Alaska Fisherman's Journal
1115 NW 46th
Seattle, WA 98107

**Alaska Native Foundation
Fisheries Program
4211 West Fourth Ave.
Anchorage, AK 99501**

- **Skiff and Shore: A Teachers' Guide to Fisheries Education Materials**

**Alaska Northwest Publishing Co.
Box 4 EEE
Anchorage, AK 99509**

- **Fisheries of the North Pacific: History, Species, Gear, and Processes**
- **Freshwater Fishes of Alaska**
- **Under Alaskan Seas: The Shallow Water marine invertebrates**

**Alaska Seafood Marketing Institute
526 Main St.
Juneau, AK 99801**

- **The Network**

**Alaska Seafood Report
130 Seward St., Suite 501
Juneau, AK 99801**

- **Quarterly**

**Alaska; University of
Marine Advisory Program
Cooperative Extension Service
U. of A, Anchorage
Anchorage, AK 99504**

- **Bibliography of Marine Teaching Materials**

**Alaska, University of, Fairbanks
Cooperative Extension Service
University of Alaska
303 Tanana Drive
Fairbanks, AK 99701**

- **"Utilization and Disposal of Crab and Shrimp Wastes"**
- **"Safety Notes for the North Pacific"**

**Alaska, University of
Alaska Sea Grant Program
U of A-Fairbanks
Fairbanks, AK 99701**

- **Alaska Marine Educators Newsletter**
- **Alaska Seas and Coasts**
- **Marine life posters**
- **Publications Directory**
- **Sea Week Curriculum**
- **Alaska Seas and Coasts**

**Albacore Press
P.O. Box 355
East Sound, WA 98245**

- **The North Pacific Deckhand's and Cannery Worker's Handbook**
An excellent source.

**Aquaculture magazine
610 E. Sixth St.
Little Rock, AR 72202**

- **Bimonthly**

**Arctic Environmental Information and Data Ctr.
(A.E.I.D.C.)
707 A St.
Anchorage, AK 99501**

- **Sea School video tapes**

**Bering Sea Fisherman
805 W. Third Ave.
Anchorage, AK 99501**

- **Monthly, free**

**British Columbia Wildlife Federation
5659 176th St.
Surrey, BC V3S 4C5**

- **Salmon posters**

- California Polytechnic State University
Vocational Education Productions
San Luis Obispo, California 93407**
- "Fish Farming in the 80's"
 - "Game Bird Management"
- Canada, Fisheries Research Board of
Receiver General for Canada
Canadian Govt. Publishing Ctr.
Ottawa, Canada K1A 0S9**
- Pacific Fishes of Canada, Bulletin 180
- Dover Publications
180 Varick St.
New York, NY 10014**
- The World of the Small Commercial Fishermen: Their Lives and Their Boats
- Ellison, Inc.
Edmonds, WA 98020**
- Starfish: Guide to Identification and Methods of Preserving
- Florida Marine Program
Florida Cooperative Extension Svc.
Institute of Food and Agricultural Science
University of Florida
Gainesville, FL 32611**
- Florida 4-H Dept. Marine Library Book List
- Hearst Books
Division of William Morrow
105 Madison Ave.
New York, NY 10016**
- Piloting, Seamanship, and Small Boat Handling
- Interpress Publications
1132 Hamilton St.
Vancouver, BC, Canada V6E 2P1**
- Western Fisheries (free)
- Kendall/Hunt Publishing Co.
2450 Kerper Blvd.
Dubuque, IA 52001**
- A Guide to Marine Coastal Plankton and Marine Invertebrate Larvae
- Kodiak Island Borough Schools
722 Mill Bay Road
Kodiak, AK 99615**
- Stars Voc Ed Curriculum; Unit 9--"Fisheries"
 - "Sea Survival" video tapes
- Marine Digest
Room 218, National Bld., 1008 Western Ave.
Seattle, WA 98104**
- Weekly
- Gregg Division/McGraw-Hill Book Co.
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293**
- The Life of the Seashore
- Mosby, C.V., Co.
11830 Westline Industrial Dr.
St. Louis, MO 63146**
- Textbook of Limnology, 1979
- National Fisherman, Pacific Office
4215 21st Ave West
Seattle, WA 98199**
- monthly magazine
- National Marine Fisheries Service
709 W. 9th St.
Juneau, AK 99801**
- Commercial Fish Species of the Pacific West Coast and Alaska

Nat. Marine Fisheries
2725 Montlake Blvd. E.
Seattle, WA 98112

- Alaska's Fishery Resources-The Sockeye

Salmon, Fishery Leaflet 636

- Salmon Rancher's Manual

Alaska's Fishery Resources-The Pacific Herring

- Northwest and Alaska Fisheries Center Monthly Report

Marine Fisheries Review

Naturegraph Publishers
Happy Camp, CA 96039

- Field Book of Pacific Northwest Sea Creatures

Nautilus Press
496 Laguardia Place
New York, NY 10012

- Marine Fish Management

Pacific Fishing Magazine
2808 NW Market St.
Seattle, WA 98107

- "Pacific Fishing"

Prince William Sound Aquaculture Corp.
P.O. Box 1110
Cordova, AK 99574

- Aquaculture News, monthly (free)

Science Books Int'l.
% Jones & Bartlett
20 Park Plaza
Boston, MA 02116

- Aquatic Entomology

Texas A&M Sea Grant College Program
Texas A&M University
College Station, TX 77843

- Sea Sources, by Norma Bagnall

United Fishermen of Alaska
197 S. Franklin St.
Juneau, AK 99801

- "Alaska Fisherman," monthly newsletter

U.S. Fish and Wildlife Service
Office of Public Use and Information
1011 East Tudor Road
Anchorage, AK 99503

- Alaska's Fishery Resources--The Pink Salmon

U.S. Government Printing Office
Washington, DC 20402

- Marine posters of marine mammals, mollusks and crustaceans and marine fishes of the Pacific; Marine mammals stock no. 003-020-00106-8; Mollusks and crustaceans stock no. 003-020-0051-7.
- Our Nation's Wetlands, stock no. 041-011-0045-9.

U.S. Coast Guard auxiliary
National Supply Center
Warehouse 1 Bay 5
Granite City, IL 62040

- Boating Skills and Seamanship
An excellent complement to Chapman's guide

Washington, University of Press
P.O. Box 50096
Seattle, WA 98105

- Pacific Salmon
- Field guide to the fish of Puget Sound and the Northwest Coast
- Pacific Seashores

Waterfront Press
1115 NW 46th St.
Seattle, WA 98107

- Ocean Leader Seafood Quarterly

Outdoor Recreation

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

- Alaska-Yukon Wildflowers Guide

Alaska Natural History Association (ANHA)
% National Park Service
2525 Gambell St.
Anchorage, AK 99503

- Publications on Alaska's National Parks and associated features.

Alaska Natural Resource and Outdoor Education association (ANROE)
P.O. Box 110536
Anchorage, AK 99511-0536

- Both state and national curricula, training, support, and other resources

Alaska Outdoor Council
3417 Katlian
Eagle River, AK 99801

- Information on outdoor recreation in the state.

Alaska, Univ. of--Fairbanks
Center for Cross-Cultural Studies
UAF, Fairbanks, AK 99701

- Curriculum for the Alaskan Environment, Small High Schools Project

Alaska, Univ. of Museum
Fairbanks, AK 99701

- Checklist. Birds of Alaska, by Gibson, D.D.
- Checklist of Mammals of Alaska.

Atlantic Richfield Co.
P.O. Box 100360
Anchorage, AK 99510

- Wildlife of the North Slope by Angus Gavin

Audubon Society, National Nature Center Planning Div.
950 Third Avenue
New York, NY 10022

- Manual of Outdoor Interpretation

Center for Environmental Education
Director of Education
624 9th St. NW
Washington, DC 20001

- The Ocean: Consider the Connections

Cispus Center
2332 Cispus Road
Randle, Washington 98377
(206) 497-7131

- Educational opportunity for teachers. Environmental science workshops. Good lesson plans.

Environmental Film Service
P.O. Box 776
408 East Main St.
League City, TX 77573

- "Outdoor Classrooms: Where Do We Go From Here?"

Fairbanks North Star School District
Box 1250
Fairbanks, AK 99707

- Enrichment activities for Outdoor Learning

194

Houghton Mifflin Co.,
Wayside Road
Burlington, MA 01803

The Interstate Printers and Publishers Inc.
P.O. Box 50
Danville, IL 61834-0050

National Park Service
2525 Gambell St.
Anchorage, AK 99503

U.S. Forest Service
Environmental Education Coordinator
P.O. Box 1628
Juneau, AK 99802

U.S. Government Printing Office
Washington DC 20402

- A Field Guide to Western Birds, Peterson
- A Field Guide to the Mammals
- A Field guide to Animal Tracks
- Tips and Tricks in Outdoor Education
- Hundreds of Ideas for Outdoor Education
- Alaska Regional Office.
- "The Common Plants of the Muskegs of Southeast Alaska"
- Guide to Alaska Trees
- "Environmental Education Resources for Alaska", Report No. 85
- The Common Plants of the Hemlock-Spruce Forest of Alaska
- Federal Outdoor Recreation Programs
- Outdoor Recreation Trends
- Quest for Quality
- Federal Assistance in Outdoor Recreation
- The Third Wave
- Private Assistance in Outdoor Recreation

Books

Petzoldt, Paul, *The Wilderness Handbook*

Van Matre, Steve, *Acclimatizing*

Self-Sufficiency

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

Alaska State Museum
Juneau, Alaska 99811

Alaska, University of, Anchorage
Adult Literacy Laboratory
3211 Providence Dr.
Anchorage, AK 99508

Alaska, University of, Fairbanks
Cooperative Extension Service
303 Tanana Dr.
Fairbanks, Alaska 99701
or local extension office

- Alaska's Native People
- Fishing and Hunting of Tlingit Men, Traveling Museum Kit
- Aleut Basket Weaving
- "Easy Steps for Canning Salmon"
- "Pickling Fish"
- "Smelt"
- "To Salt Fish"
- "The Fisherman Returns"
- "Pressure Canning Alaska Fish at Home"
- "All About Alaska Clams"
- "Hypothermia—Cold Blooded Killer"
- "Some ABC's of Fo'c'sle Living"
- "Wild Edible and Poisonous Plants of Alaska"
- "Alaska's Game is Good Food"
- "Tanning at Home"
- Reindeer Roundup Slides

**Alaska, University of, Fairbanks
Museum
Fairbanks, Alaska 99701**

- Eskimo Grass Baskets, Traveling Museum Kit
- Sea Mammal Hunting in Western Alaska, Traveling Museum Kit

**Anchorage Community College
2533 Providence Ave.
Anchorage, AK 99504**

- Fishwheels and How to Build Them

**Emerson Books
Reynolds Lane
Buchanan, NY 10511**

- Netmaking

**Friends of the Earth (FOE)
Box 104432
Anchorage, AK 99510**

- "NOT MAN APART"

**Hearst Books
Div. of William Morrow
105 Madison
New York, NY 10016**

- The Guide to Self-Sufficiency

**Mother Earth News
Box 70
Hendersonville, NC 28739**

- Articles on self-sufficiency:

**Oregon State University Extension Service
OSU Marine Science Center
Newport, OR 97365**

- "Sportsman's Guide to Handling, Smoking, and Preserving Coho Salmon, Building a Small Crab Cooker for Home Use, Home Freezing of Seafood, Smoking Fish at Home--Safely."

**South East Regional Resource Center
218 Front St.
Juneau, AK 99801**

- Root, Stem, and Leaf, Native Wild Edible Plants of Southeast Alaska, how to spot, and cook them. *Out of print, but copies are on hand.*

**Tanana Chiefs Conference
Tanana Survival School
102 Lacey St.
Fairbanks, AK 99701**

- Beaver Trapping
- Making Snowshoes
- Tanning Moosehide and Making Babish & Rawmame
- "Building a Birch Bark Canoe," videocassette
- "Fish Wheel," videocassette
- "Fishing on the Yukon," videocassette
- "Moose Hide Tanning," videocassette

**Tundra Times
Box 1287
Fairbanks, Alaska 99701**

- Weekly newspaper, often features articles on subsistence

Books

- Anchorage Daily News, 1966, The Village People
Brow, Terry & Hunter, Rob, Concise Book of Winter Camping
Burmeister, Richard A., The How Book on Dog Sled Construction and Equipment
Guild, Ben, The Alaskan Mushroom Hunters Guide
Hulten, Eric, Flora of Alaska and Neighboring Territories
Oswalt, Wendell H., 1967, Chandler Publishing Co., San Francisco, Alaskan Eskimos
Ray, Dorothy Jean, Artists of the Tundra and the Sea, Univ. of Washington Press, Seattle, 1967
Rustrum, Calvin, Paradise Below Zero
Vanstone, James, Aldine Publishing Co, Chicago, 1974, Athapaskan Adaptations: Hunters and Fishermen of the Subarctic Forests**

Films

Canada, National Film Board of, "How to Build an Igloo, Land of the Long Day, Parts I and II, AT The Caribou Crossing Place, AT The Autumn River Camp, At the Winter Sea Ice Camp, At the Spring Sea Ice Camp, Stalking Seal on the Spring Ice, Jigging for Lake Trout, Group Hunting on the Spring Ice, Building a kayak, Fishing at the Stone Weir, Deadfall Trap."

Encyclopedia Britannica Films, "Eskimos--Winter in Western Alaska"

Indiana University Audio-Visual Center, "Life in Cold Lands"

Scott, filmstrip--3 parts; "Eskimos of St. Lawrence Island"

Walt Disney Productions, available from Fairbanks North Star School District "Eskimo Hunting and Gathering Food, Transportation in Arctic Regions"

Wildlife

Alaska Dept. of Fish & Game
Box 3-2000
Juneau, AK 99802

- "Fish & Game" Magazine
- Wildlife Notebook Series
- Alaska's Wildlife and Habitat, Vol. I and II
- "Game Fishes of Alaska", posters
- "Major Ecosystems of Alaska," posters
- "Fish & Game Bulletin"
- "Common Fresh & Saltwater Fishes of Southeastern Alaska," Bull. No. 1792

Alaska Dept. of Fish & Game
Fairbanks Regional Office
1300 College Road
Fairbanks, AK 99701
452-1531

- Many films, filmstrips, and videotapes on Alaska wildlife write or call for list.
- Alaska Wildlife Watcher Reports
- Landscaping for Wildlife in Alaska
- Birdhouses for Alaska
- Hundreds of films and videotapes about wildlife and habitat; write for list.

Alaska State Film Library
Dept. of Education
Pouch G
Juneau, AK 99811

Alaska Dept. of Fish & Game
Nongame Program
333 Raspberry Rd.
Anchorage, AK 99502
Contact Sue Quinlan or Jeff Hughes

- Guide to Wildlife Viewing in Alaska
- Winter Bird Feeling in Alaska
- Landscaping for Wildlife in Alaska
- Birdhouses for Alaska
- Alaska Wildlife Week - Assorted units on wetlands, wildlife habitat, wildlife population dynamics, Alaska's forest ecosystems, arctic tundra ecosystem, ecological principles

Alaska Geographic Society
Box 4-EEE
Anchorage, AK 99509

- Alaska Whales and Whaling
- Mammals of Alaska

Alaska Northwest Publishing Co.
Box 4 EEE
Anchorage, AK 99509

- A Field Guide to the Birds of Alaska by R.A. Armstrong
- Reptiles and Amphibians in Alaska, the Yukon and Northwest Territories

Alaska Public Lands Information Center
Offices in Anchorage, Fairbanks, Tok, Ketchikan

- Information on wildlife on federal lands.

- Alaska SeaWeek Program**
CHRD-Dept. of Education
UAF
Fairbanks, AK 99775-0900
- 1983 "Be it Ever so Humble, There's No Place Like Habitat"
 - 1984 "Water, Wetlands, and Wildlife"
 - 1985 "Wildlife for the Future"
- Interior Alaska Trappers**
Box 60418
Fairbanks, AK 99706
- "Alaska Trapper" Magazine
- American Cetacean Society**
P.O. Box 4416
San Pedro, CA 90731
- Gray Whale Teaching Kit
- Arctic Environmental Information and Data Ctr.**
(A.E.I.D.C.)
707 A St.
Anchorage, AK 99501
- Alaska Quest film series
- Audubon Society, Anchorage**
P.O. Box 1161
Anchorage, AK 99510
- "Alaskan Bird Chart" and "A Guide to the Audubon Alaska Birds Chart," large poster with color photos and map showing migration routes
slide shows on Potter's Marsh and Pribilof Islands
 - "Last Stronghold of the Eagles", film about the Chilkat River in Southeast Alaska
 - "Audubon" Magazine
- Audubon Society**
Alaska Regional Office
308 G St.
Suite 219
Anchorage, AK 99501
- Posters with excellent drawings of wildlife , each outlining life histories of wildlife. Hoofed animals (mountain goats, sheep, bison, and moose); furbearers (coyote, wolf, beaver, bear, lynx, river otter). Cost: \$4.00/set or \$8.00 for two sets.
 - The Beach Book
 - The Creek Book
 - Estuary Studies
 - The Lake Book
 - The Pond Book
 - The Snow Book
 - "Managing Wildlife"
 - "Game Bird Management"
- British Columbia, Ministry of Environment**
Information Services Branch
Parliament Building
Victoria, B.C. V8W 3E1
- British Columbia, University of**
Western Education Development Group
Vancouver, Canada V6T 1W5
- California Polytechnic State University**
Vocational Education Productions
San Luis Obispo, California 93407
- "Ducks Unlimited" Magazine
- Ducks Unlimited**
One Waterfowl Way
Long Grove, IL 60047
- Multidisciplinary Wildlife Teaching Activities
- ERIC Clearinghouse for Environmental Materials**
3rd Floor
1200 Chambers Road
Columbus, OH 43212

- Fish and Wildlife Reference Service**
Sterling Software
Federal Systems Group
6011 Executive Blvd.
Rockville, MD 20852
- Computerized information system and repository that provides state research information
 - Fish and Wildlife Reference Service Letter
- Greenpeace**
Box 104432
Anchorage, AK 99510
- Strong conservation advocates.
- Kansas, University of Museum of Nat. History**
Lawrence, KS
- "Mammals of Northern Alaska", Misc. Publ. No. 8
- Hobar Publications**
1234 Tiller Lane
St. Paul, MN 55112
(612) 633-3170
- Fish and Wildlife of The Upper Midwest and Related Review, 400 questions in five files dealing with birds, mammals, fish & insects. Apple II series computers, TRS 80 III;4
 - 24 outdoor classroom guides dealing with wildlife and wildlife habitats.
- Jenny Publishing Co.**
57 Queen Ave., S.
Minneapolis, NM 55405
- Wildlife Management, Vol. I and II, Agex 300/30
- Gregg Division/McGraw-Hill Book Co**
Western Regional Office
8171 Redwood Hwy
Novato, CA 94947
(415) 897-5293
- Deer and Deer Hunting
 - Successful Bow Hunting
 - Bear in Their World
 - Bear Hunting
- National Farm Book Company**
P.O. Box 206 - 5149 Highway T.
Amherst, Wisconsin 54406
(715) 824-5445
- Films on national parks and conservation
- National Park Service**
Alaska Area Office
Room 202
540 West 5th Ave.
Anchorage, AK 99501
- "The Class Project"
 - Nature Quest Workshops
 - "National Wildlife" Magazine
 - Has two units with Alaska-specific materials on wetlands and wildlife habitat
Contains a wealth of learning activities on many areas of Natural Resources Management.
 - "Nature Conservancy Financial Report"
- The Nature Conservancy**
1800 North Kent Street
Arlington, Virginia 22209
- Marine Mammals of the Eastern North Pacific and Arctic Waters
 - Butterflies of Alaska, color poster
- Pacific Search Press**
222 Dexter Ave. N
Seattle, WA 98109
- Scavengers-Science Education Supplies**
Box 81411
College, AK 99708

Simon and Schuster Inc.
1230 Avenue of the Americas
New York, NY 10020

- Gulls

Stackpole Books
Box 1831, Cameron and Kelker Streets
Harrisburg, PA 17105

- Ducks, Geese, and Swans of N. America

U.S. Fish and Wildlife Service
Office of Public Use and Information
1011 East Tudor Road
Anchorage, AK 99503

- Posters depicting habitat and wildlife of south central Alaska.
- Films and wildlife and conservation.

U.S. Geological Survey
101 12th Avenue, Box 12
New Federal Bld.
Fairbanks, AK 99701

- Topographic and geographic maps of Alaska

U.S. Government Printing Office
Washington, DC 20402

- "Ducks at a Distance--A Waterfowl Identification Guide;" Stock No. 024-010-00442-8.
- "A Host of Seabirds, Alaska," 6 small color posters.

Washington, Univ. of, Press
P.O. Box 50096
Seattle, WA 98105

- Marine Birds and Mammals of Puget Sound

Western Regional Environmental
Education Council
Alaska Wildlife Week
Dolores Scott, ADF & G
Box 3-2000
Juneau, AK 99802

- Project Wild (Secondary Activity Guide)
Single biggest effort in Education; annually produced instructional materials effecting a theme related to Alaska specific wildlife. Excellent activities for wildlife ecology and management.

The Wildlife Society
Suite 611
7101 Wisconsin Avenue, N.W.
Washington, DC 20007
Alaska Chapter:
c/o John Shoen
800 Fritz Cove
Juneau, AK 99801

- The Ways of Wildlife

Woodstream Corporation
Niagara Falls, Ontario, Canada L2E-6T3

- "Wildlife and the Old-Growth Forest of Southeast Alaska" (available as slide show or video)

- Trapping and Wildlife Management

Books

Dufrense, Frank, Alaska's Animals and Fishes
Everett, Michael, Birds of Prey
Freeman, W.H. and Company, San Francisco, CA, Wildlife Management
Murie, Adolph, A Naturalist in Alaska